

TRAINING FOR SPORTS

Walter Camp



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BLOCKING AND STARTING PRACTICE.

SCHOOL, COLLEGE, AND SERVICE ATHLETICS

TRAINING *for* SPORTS

BY
WALTER CAMP

ILLUSTRATED

NEW YORK
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To
Mr. and Mrs. E. T. Stotesbury
in recognition
of their work for the boys
in the Service

PREFACE

No country in the world has carried the art of training athletes to anything like the degree of perfection attained in the United States. It has become the recognized profession of hundreds of men like the late lamented Mike Murphy, who carried it to an exceptional degree of success. The victories of our teams in the Olympic games bear tribute to the skill of the men who have specialized in this work. At the time of the World War, men of this profession volunteered, were commissioned and succeeded in effecting the greatest improvement in the condition of the fliers on some forty aviation fields. The author of this book has known most of our best men in this branch and would unhesitatingly intrust his son to these men, not alone for his physical training, but for the moral effect as well. Many a boy in this country, however, may not be so situated as to have the oversight and advice of one of these experienced men. Many a coach or director may not have the opportunities for

studying these methods through first hand. Hence this book is written to help on the way and to give some idea of the principles involved in the conditioning of athletes. As one would say of the doctor—so I would say of the trainer—if you can get a good one, go to him at once—if you cannot, then you may find in the columns of this book some “first aid” suggestions that will save your men from disaster.

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TRAINING FOR SPORTS

CHAPTER I

GENERAL PHYSICAL CONDITION

THE word training essentially implies a preparation; whether it be for severe physical effort as any athletic competition or military service in time of war, or merely for the ordinary conduct of life. Regardless of the immediate end, this preparation is a necessary part of the growth of every boy, and the athletic incentive is always a valuable one because a consistent course of regular exercise purely for its own sake is dull and unappealing at an age when the spirit of play and competition is so keen. In this country our love of competitive sport and team play constantly tends to develop men of strong and supple bodies, easily adaptable to changing conditions of physical hardship and periods of severe physical strain,—men who preserve their youthfulness of body well into middle age. Our performance in the Great War may be attributed directly to this tendency in that

we were able to take men from a civilian life that was physically inactive and in an amazingly short time prepare them for the severe tests of endurance and strain which the war demanded of them.

There is, however, a widespread feeling that the rigors of training for college athletics unfit a man for the sedentary life of business. It is said that the college athlete must submit to a training which over-develops certain parts of his body at the expense of other parts. It is said that serious consequences result when, in later life, the parts so developed are less actively in use, or that the strain of the exertion necessary in a crew race or distance run may so affect the heart that it can never entirely recover. These statements are perfectly true in some cases where the preparation has been sudden and improperly forced. It is likely to be true in every case where there has been too little general conditioning and too little foundation in the building up of a sound constitution in early youth.

Training as a preparation for games and contests should be cumulative but not exhausting to the vitality. There should be a gen-

eral building up of the system and at the same time a gradual increase of the powers to meet the great effort which comes at the time of final contest. If this is done, the boy will not only be successful in the accomplishment of his immediate purpose, but he will build up a constitution and acquire a knowledge and a habit of normal physical training which will enable him to carry on through life. The contest which the boy is going to face when he becomes a man, leaves college, and goes out to face the world, demands the preparation that physical training gives in the same way that the athletic contest demands it. Our aim should be to combine these preparations in a gradual, cumulative, general conditioning during boyhood; building up a solid foundation, not by giving special attention to the forced and rapid development of particular sets of muscles, but by a variety of games and exercises which, more or less unconsciously, develop all the muscles equally, by an abundance of fresh air, wholesome diet, plenty of undisturbed sleep and general cleanliness.

In general a boy should be in training all

the time—not merely in the season of the particular sport in which he is interested. The boy who trains for two or three months in the year and allows himself complete relaxation and neglect of his body during the rest of the time, with frequent excesses, and little regular exercise, will find that he must work twice as hard and run a very much greater chance of straining or exhausting himself during the intensive period of work. If he will follow a few rules of health such as will be suggested in later chapters he will find himself able to accomplish more in his specialty with very much less effort. Primarily he should keep clean, avoid excessive eating of sweets, take plenty of time for meals, avoid tobacco, drink plenty of water and sleep about ten hours a night. He should begin the day with a cold bath and hard rubdown, and should take a few exercises such as the “Daily Dozen” described elsewhere to stretch his muscles after the night’s relaxation, to restore suppleness, start circulation, insure erect carriage and improve the breathing. A few important things should be remembered about the exercise during the day. Violent exercise

should not be taken immediately after eating, drinking should be avoided when hot from exertion, and a reasonable time should intervene between the rubdown after exercise and his eating.

One habit which should be cultivated by every athlete is that of familiarity with fresh air. I do not mean merely sleeping with the windows open or taking deep breaths in the morning. The whole body should be exposed to the air as often as practicable. Since civilization forces us to wear clothes which keep the air from our bodies so much of the time, we should take every opportunity to let our pores breathe by giving ourselves air baths. A good chance for an air bath is in the morning while shaving. All clothes should be removed and the body exposed as long as possible. If this is done while shaving there is no waste of time and the habit is easier to form in this way.

These rules and others which will be given later (including the "Daily Dozen" exercises) are the result of long evolution and the real history of progress in training for athletics. The methods in use during the early

days of athletics in this country were extremely severe and worked unnecessary and harmful hardship on the men. It is interesting to trace the progress toward the present methods through the early days of rowing in the American colleges. In the period from 1858 to about 1865 the diet consisted mostly of meat, the supply of water very limited so that the men were forced to endure thirst; every effort was made to reduce flesh, strenuous exercise was required on an empty stomach, and the crew rowed four miles every morning and afternoon throughout the season. In the period from 1865 to 1887 there developed a complete change in method of training which was based on the failure of the earlier system to get results. The diet was enlarged and varied, the exercise became gradual and more general and came to include calisthenic exercises for all-round development. It began to be recognized that some flesh and weight were assets and that a large chest was absolutely indispensable. But most important of all it was realized, and has since become universally accepted, that overtraining is one of the greatest dangers of crew work

as it is of all the more strenuous sports. The greatest mistake still tended, however, to persist, namely the belief that large muscles were a thing to be desired, and the calisthenic work partook of the error.

The properly trained athlete of today remains, in his attitude of mind, at least, an athlete through life. He has gained a respect for his body which will keep him from abusing it. He has never acquired a taste for dissipation or excesses during the period of his life when most of his tastes are formed. He has learned a habit of exercise which, while it will and must become more moderate with increased age and under more sedentary conditions, he will never give up. He will not have become "fed-up" by training, as were the athletes of the last century; a condition which often led to violent reaction, as soon as the training was over.

Thus we make of athletics, not an end in itself but a means to a healthy manhood, and one which can endure the strain of a professional life or of a business office and yet be ready for such an emergency as so many business men were forced to face in the recent

war. We see that properly conducted athletic training is not a menace to after life, but of real value, especially as it inculcates personal habits which are as useful to the man of middle age as they are to the boy in school or college. The succeeding chapters will trace the training through childhood, school, college and middle life and will show specifically in what it consists and how it is helped rather than hindered by the various kinds of athletic competition.

CHAPTER II

GENERAL TRAINING ACCORDING TO AGE

THE earlier in life a general building up is begun, the better will be the ultimate results. With an early beginning the work can be more gradual, less conscious, and more as nature intended it. In childhood the instinct of play, the desire for experiment, the necessity of variety produce unconscious exercise of all the muscles. But in the play of the child each muscle is exercised for a short time only and there is no specialization. The child never keeps for long at any one game or kind of play. He concentrates very little and is easily distracted; also his muscles tire quickly if any one motion is constantly repeated. If you watch a child of under ten years who is doing something which requires constant repetition of a motion by some one set of muscles such as walking or rowing a boat, you will notice that he keeps trying to change the

motion by breaking into a run or by rowing first with one oar and then with the other and so on. This is Nature's expression of her desire at that age for variety of motion.

Any set form of exercises continued for any length of time is bad for children of early school age. They cannot walk far because, in walking, the muscles of the back are set and that is unnatural at an age when exercise should be constantly shifting and changing. They should never have more than a minute or two at a time of calisthenic work, and this should consist mostly of muscle stretching exercises and breathing. The more spontaneous and the less organized their sports and games, the better. After a child has learned the game idea and understands what it means to play according to certain rules, and especially when he begins to feel the spirit of competition, which, with boys, is generally an instinct, he will be constantly discovering and inventing new games and variations on old ones which will lead him into a healthful, natural and unconscious daily exercise of all his muscles. This will prove to be all that is necessary for early physical training.

The child should learn at an early age to love fresh air, to enjoy being outdoors as much as possible, to respect his body and to keep clean. Sleep is essential and the lack of it checks growth in all directions. If these things are kept in mind and the child is allowed to play the sort of games which spontaneously appeal to him, and not bothered with set exercises which develop certain muscles more than others, he will grow normally and establish in his childhood a good foundation for any sort of athletic work later.

From twelve to fifteen, we can begin more definite training. Boys of this age get most of their physical development through sports and games, which now become more regular, more organized, and generally require more concentration. It is, in fact, an age of concentration if not of specialization; the boy develops interests that are immensely absorbing to him, and his mind and body grow rapidly under these influences. He is thinking constantly of athletics, organizing teams, tournaments, meets, etc., and making sports a more conscious and serious part of his daily life.

Here, also, we may begin more defined train-

ing. At this age boys may be taught something about their diet, although if in good health and out of doors they can eat almost anything of a plain, wholesome nature. There is no necessity for cutting off sweets so long as they eat other wholesome food. Sweets should preferably be eaten after other food. The important thing to avoid is the habit of eating between meals or eating meals at irregular times, taking away the appetite by pastry and candy and thus making these things the basis of diet instead of solid food. A later chapter will take up the subject of diet in more detail and will give some useful rules which may be profitably followed by boys at the beginning of their athletic career.

Boys do not take kindly to setting-up and calisthenic work, but it is important that they begin to take certain exercises to develop poise and carriage, open up the thoracic cavity, put muscles over the shoulder blades and strengthen the neck. In doing this we are preparing the boy for his future, not only in athletics, but in life. Our present games do not give enough of this exercise for the back, shoulders and neck. That is why we have so

many stoop-shouldered athletes. The exercises used should not be over-strenuous or last too long; they should be made as little of a bore as possible, and when the boys realize that this work will help them in their games, they can be persuaded to take them with equanimity.

Between the ages of fifteen and twenty-five, the general physical condition is of vital importance, not only for success in athletics, but in the equipment for life. It is primarily for boys of these ages that this book is intended. It is during this period that the hardest, most strenuous, most consistent physical work is done. It includes the last years of school and all of college for most boys, and if they will accomplish important success in athletics they must keep in training most of the time during these years. The most unfortunate effects of these ten years occur at the point where a man who has been leading an exceedingly vigorous life graduates from college and suddenly goes into a factory or business or a profession which does not allow nearly the same amount of time for the physical side. Here it is essential that the exercise be less-

ened gradually and certain compensation made if we wish to have the man in good physical condition later.

Calisthenic exercises are well adapted to the period of this change. They take up little time and require no equipment and can be done in the morning before the bath and rub-down. Breathing exercises are particularly desirable and stretching of the muscles and trunk. The simple movements known as the "Daily Dozen" do not take more than eight or ten minutes, keep the important muscles of the body in good shape and help the general condition without causing muscular fatigue. In the first year of business, a man should get all the fresh air he possibly can, walking to and from his office and spending his week-ends out of doors. But he should not indulge in such an orgy of strenuous and long-continued exercise as to leave him tired out on Monday morning.

For the next fifteen or twenty years, a man's pathway is practically fixed, and he must get what he can out of it. System is essential. Daily exercise, even of a limited character, is of the greatest importance,—not

frenzies of exercise taken once a week or once a month. These occasional over-exertions are likely to have bad effects at this age, especially if a man lets himself go, physically, between them.

This is the age when he should be in the prime of his physical condition, but he has already passed the age when Nature will stand for serious overdrafts as she will from twenty to twenty-five. At this earlier age, forty-eight hours' rest will restore a man completely from any physical strain he is likely to undergo. Later there may be serious consequences, although this depends largely on the physical condition in which a man keeps himself, the nature and quantity of his exercise, and the strength of the constitution he has built up in his earlier years. There were men in all the regular armies who were able to endure the most difficult kinds of physical exertion during the war because their regular drill and training in the army had kept their general condition so good. There were many civilians of over forty who were able to stand the strain and whose endurance was in many cases equal to that of much younger men.

This was because their physical training had aimed at an all-round preparation and had begun gradually.

From forty-five on, a man must realize that his physical powers have begun to wane and that while nature has always kept a certain margin of reserve so that he can, with impunity, tire himself once in a while, he cannot safely repeat this too often. He must also plan for the kind of exercise and sport that he can continue for the next ten or twenty years, and begin to adjust his economy accordingly. He may play golf and take such exercise as riding, walking, swimming, etc., in moderation. The amount he can do at this age will largely depend on the condition he has been able to keep up and the foundation he has laid in his boyhood and youth.

The main thing to remember about physical work after forty is that the reserve must never be drawn on beyond reasonable limits. A man who derives his income from interest on capital does not draw on his principal unless he is forced to by unusual circumstances. He does not sell his securities and spend the money because he knows that by doing so he

reduces his future income and leaves nothing to fall back on in difficult times. There is a perfect analogy between this and the unnecessary spending of reserve physical strength. A man who continually draws on his reserve finds that his future capacity for work is reduced, and his supply so impaired that when sickness comes he has no reinforcements to bring to his aid.

There is a curiously prevailing belief that this reserve supply is unlimited. No one supposes such a thing about his bank account. Yet sensible men often draw down their account with Nature, until there is literally nothing left. She sends them frequent warnings in the form of headaches, backaches, nervousness and insomnia. Then she loses patience, descends on them and puts them in jail. Pleas of ignorance and intent are useless. A man may have been so absorbed in his work that he may not have known that he was being warned. He may have been working from highly altruistic or patriotic motives. The result is the same. Nature convicts on the facts alone.

Nevertheless, there are means of constantly

increasing the principal and making it more productive. A man whose chest is contracted from a round-shouldered and stooping position can do more and better work if, by exercise, he can open up his thoracic cavity and breathe more deeply. A man whose circulation is poor can so repair it that his actual mental processes are aided by the change. He may so strengthen his abdominal muscles by exercise that his organs will be properly supported. He may "massage" his intestines so as to increase their secretions and overcome constipation. The exercises of the "Daily Dozen" are designed to attain these very ends, and if they are regularly practised by men whose occupations are sedentary, they will greatly increase the health and the reserve force, and enable a man to do very much more and harder mental work.

But the need for these exercises is by no means confined to men of middle age nor to those whose life is sedentary. The athlete needs them, for in the work he does there is nothing to give him a correct posture. A man can play baseball, football or tennis in a round-shouldered position just as well as

with his shoulders back and his chest expanded. Many of our athletes have a stooping carriage because nothing in their athletics has taught them to stand up straight. The man who rows has a particular need for the exercises which open up his thoracic cavity and increase his chest capacity.

The farmer, for example, has an exceedingly active life. He exercises almost constantly from the time he gets up until he goes to bed. It is unquestionably true that he does not need the ordinary Swedish exercises which build up massive muscles on the arms and legs. But the farmer of fifty is nearly always bent and stooping. He shows his age earlier than other men. He has neglected his chest, neck, the position of his shoulders. A few exercises every day might have saved his posture and conserved his youth, without adding any appreciable burden to the day's work.

Physically, we are really wild animals in the captivity of civilization and we can learn much from the animals we have confined. A visit to the zoo will reveal the fact that most of the mammals there which have been deprived of their normal exercise devote a good

part of their time to a system of calisthenics which is designed by nature to conserve their health in spite of their confinement. Their movements are those of stretching. Their legs are exercised in pacing their cages, but the other muscles of the body are developed and kept in condition by these stretching exercises. This same sort of exercise is equally healthful to the human animal.

A few years ago a friend of mine made, at my suggestion, a moving picture film of these animals going through their stretching movements. I wanted it used in connection with the physical training work in the navy, in which I was interested at that time. My friend told me that he had gone to the zoo with the photographer prepared to wait several days in the hope of catching some of the animals in the act of stretching. "As a matter of fact," he added, "I didn't have to wait five minutes. Every animal in sight was stretching when I arrived, and they were still doing it when I left."

Everyone knows the distinct sense of relief that comes from a good stretch. This same sensation comes from moderate exercise with

the "Daily Dozen," and the results in a short time are extraordinarily gratifying. Regardless of age and occupation, they are exceedingly valuable aids to the preservation of good general condition.

CHAPTER III

WHY ATHLETES GO STALE

THE two principal dangers that confront the athlete are those of overwork and underwork; of these, the former is by far the greater. The natural energy and enthusiasm of boys of school and college age, their fear of being thought "quitters" or "yellow," their sense of loyalty and responsibility to their school and college—all these influences tend to make an athlete work far beyond his strength and have, in many cases, brought about serious consequences. It is difficult for a boy, in the midst of the strain and excitement of the training season, when the whole atmosphere about him is tense with the anticipation of the coming game, to think very much about the future—of the life that is going to follow his graduation, for which, in large measure, his training now is a preparation. It is even more difficult, at a time when the fate of the whole world seems to hang

on the outcome of that final game, for him to maintain a proper sense of proportion. Yet it is at this very time that he should be most careful, for if he strains himself by any extreme exertion or tries to endure beyond his capacity, he not only runs a risk of life injury, but he is very likely to put himself out of the particular game or sport for which he is training.

Coaches and trainers are coming to realize more and more every year the necessity for cautioning the athletes under their care in this respect. Physical directors in schools and colleges are making a special point of carefully watching the work of the men in relation to the capacity of the individual; slowing up certain men that are showing signs of over-exertion and those who are endowed by nature with less robust physique. In most schools and colleges a boy is required to pass a physical examination and sometimes a strength test before he is allowed to enter the more violent forms of athletic contest, such as football, running, rowing, etc. Then during his training he is watched in relation to this test and kept carefully within its limits.

This brings up an extremely important point, and I think it would not be amiss to repeat here something that I said in another book in this series, for it cannot be too often repeated. It is common for schoolboys to overrate their capacity, and because one of their number has achieved some extraordinary feat to believe that with sufficient training they might all accomplish a similar performance.

It is quite usual in this country to rate the victory higher than the game, and for this reason a training season in some sport which should be amusing and healthful to the athletes becomes a severe physical and nervous strain, often mere drudgery in which the final event is the only high light, and that last contest accompanied by such tension that there is a distinct relief and let-down when it is over. It is unfortunate that so much of our play, although it has such a strong character development, lends itself so easily to excess of competition. No one wishes to take the virility out of it but to safeguard it from desperate extremes.

Going "stale" or going "fine" may be

due to any one of a large number of causes of which worry, poor food, wrong eating and drinking, too severe competition, lack of sleep, indecision, shifting coaches, monotony and dissipation are the most important. In track, athletes often go stale from too many time trials. A time trial may have all the excitement, nervous strain and competitive effort which attend the event itself, and if this is too often repeated a man's capacity for making the effort required to win a race is exhausted. Besides this he becomes nervously tired, is constantly worried lest he be eliminated; and he may end by a complete loss of interest, a decline in physical powers, or possibly a nervous breakdown.

Worry of all kinds should be eliminated as much as possible during the training period. One of the reasons for the success of our soldiers in France under all conditions of work and strain was that they almost never worried about anything. They found that they were able to endure every sort of physical hardship as long as their minds were free, but anything that upset them mentally, such as bad news from home, immediately lessened their powers

of resistance and endurance. It is so with the athlete. When he begins to worry about the game ahead, his own condition, his school or college work, he begins to lose sleep, he becomes subject to indigestion, lack of appetite and depression of spirits. All of these have physical effects, and if a boy allows himself to worry to this extent, he is likely to lose the very thing he most desires.

While worry is often the cause of rundown health, it is more often the effect of such a condition. A man who is in perfect health, who is neither over-tired nor underworked is generally free from it. Great exhaustion often produces a restlessness of mind and imagination that makes sound refreshing sleep impossible, no matter how great the fatigue. Thus it often happens that a boy who has become exhausted in his training begins to worry about the work of the classroom so that he cannot sleep. This can be overcome to a large extent by a complete relaxation of the mind just before going to bed, changing the subject of thought by a game of some kind or by reading some light story.

The subject of food during intensive train-

ing is one on which there has been much controversy. But though there is difference of opinion on details of diet, there is general agreement on the necessity of having the food fresh and well prepared. Vegetables that are stale, old meat, over-ripe fruit, canned foods that have been opened too long, are almost certain to cause diarrhea or ptomaine poisoning, which may be so weakening as to put a man out of the running for the whole season. Also it is very important that food should be properly cooked. Undercooked potato, oatmeal, rice, etc., cannot be digested, and while they may not cause any immediate sickness, they deprive a man of the nourishment he should be getting. Besides the actual physical effects of poor food, there is a dissatisfaction which comes from eating it which is likely to lead to indigestion and loss of appetite. There is a cumulative effect that comes from eating poorly prepared food day after day that is very demoralizing. Boys in training should be able to look forward eagerly to their meals; they should never dread them as they surely will unless there is careful supervision of the training table.

Of course if poor food is served at the table, there will be a constant temptation to eat between meals at all sorts of odd hours. This improper eating is one of the causes of going stale which never fails. Nature has so arranged our internal machinery that regularity is absolutely essential. To put food into your stomach at a time when that organ neither expects nor requires it, is to put the digestive mechanism under a strain which, sooner or later, will inevitably clog the system and cause stoppage of the whole digestive function. When this happens the athlete's career is at an end. It makes no difference how healthful the food is which is taken at these times. If it is irregularly eaten it is worse in its effect than much richer food taken regularly. The restrictions on diet are so few, as will be seen in a later chapter on that subject, that it should not be much of an effort to curb this desire for between-meal-eating, which is generally nothing more than a mere nervous habit, if the food that is provided at regular meals is sufficient in quantity and prepared in the proper way.

It is a mistake to try to economize on the

training table. The team is almost sure to suffer. I know of one university in which, as part of a general scheme of economy, they cut down especially on the training table, which immediately began to fall below standard. The linen was less frequently washed and presented a very unappetizing appearance. The food was badly cooked and badly served. At one meal bad meat was offered which, besides resulting in sickness, prejudiced the men against all the meat that was served afterward. The general atmosphere of untidiness in the room caused the men to dread their meals and to eat very little. The effect on the team was immediate and they soon began to go stale, losing their games, getting discouraged and ending with an unsuccessful season. Another mistake made during this same period of economy was a rule that no man should own an athletic suit, but that it should be lent him. The result of this was that the suits, which were improperly disinfected, caused the rapid spread of a skin disease.

Drinking plenty of water is a necessity for the athlete who would keep in good condition.

Seven or eight glasses a day are advisable, but the greater part of this should not be taken with meals or immediately after exercise. Drinking much water with meals leads to getting too little nutriment, while drinking when very much overheated is often extremely dangerous. Water should never be iced, but should be drunk at the temperature of the room. Milk must never be drunk rapidly, but should be slowly sipped.

Too severe competition so that a boy is constantly keyed up is a strain which is likely to have bad results toward the end of the season. Fear of being dropped from the team, the constant irritation of someone pressing close behind him ready to take his place at the first sign of weakness, may get on a man's nerves to such an extent that he may suffer from all the effects of the worry already described. Indecision on the part of a coach may be the cause of this; continual change of mind on the part of anyone in command of men, whether he be an army officer, an employer of labor or an athletic coach, is always demoralizing. The inability of a coach to decide between two men has sometimes caused both

of them to go stale from nervous strain and excessive effort.

Shifting coaches has the effect of changing method, which often brings about lack of confidence. Boys who have gone halfway through a football season, for instance, under one coach, have gained confidence in his method. If he is suddenly replaced by another man whose method is entirely different, the boys naturally believe that all they have learned is useless. This is likely to discourage them so that they may lose interest in the rest of the season. Again, a new coach has no knowledge of the work of the individual members of the team, and is likely to do some of them serious injustice. Furthermore, he may, through ignorance of the individuals on his team, put an excessive strain on some boy who needs light work.

Monotony is one of the most natural and logical causes of going stale. Indeed, the very expression "going stale" implies a dullness and dreariness of routine, a sort of stagnation of sameness. During the intensive drill periods of the war, officers found that it was absolutely essential to vary the monotony

by games, walks, snowball fights, boxing matches and any other diversions that suggested themselves. Without these changes, the men would have inevitably gone stale, that is, they would have lost discipline, become sloppy in their drill and deteriorated in efficiency. The same is true of an athletic training season. General regularity of schedule is essential but the variety of its detail is even more so. There must be enough element of change or, if possible, of surprise in the work to make the men look forward to it. A coach of any experience can easily tell when his men are getting "fed-up" on any particular detail of practice. That is the time to change quickly to something quite different, regardless of any prearranged schedule.

With the best conditions, the training table often gets very monotonous late in the season. Eating every day with the same men sometimes gets on a man's nerves. He gets to know them so intimately in the daily work that to see them again and again at meals sometimes becomes very tiresome to him, no matter how much he may like them. The conversation becomes dull because he has

heard it all before. Most of the men are so full of their training that they cannot talk of much else. If discussions of the game are tabu, as they often are, because any heated discussion during meals is bad for the digestion and because change of thought at meal-time is most advisable, the conversation lags from loss of interest. Often it is a good thing for a man who shows signs of going stale to be taken away from the training table for a few days and given a chance to associate with different people, so as to get a change of thought. This is particularly desirable with such a man as a quarterback or the stroke of a crew whose success depends largely on his coolness and nervous control. Of course such a man is by far the most likely to go stale mentally. Another way to relieve monotony is to change the opponents. A football team that has been playing against the same scrub team all the time might be given a chance to play the freshmen occasionally. In a boat, any change that is made stimulates interest. Of course most of these changes will occur early in the season before the monotony has grown intense, but at any time a shake-up may be a

good thing for a stale team, even if it is only temporary.

A boy in training for any athletic sport should get at least nine hours' sleep every night; ten will do him no harm. This sleep should be sound and undisturbed. Every effort should be made to eliminate all noise which tends to keep one awake or cause waking during the night. The proper amount of exercise and a healthy mental and nervous condition should induce sound sleep if the conditions for it are right. Mosquitoes in the room during the night and flies in the early morning are almost sure to prevent sleep and must be kept out. A mosquito bar such as is used for camping and which may be obtained at any sporting goods store at very slight expense will effectively accomplish this and will well repay the effort.

More than a word on dissipation should hardly be necessary to an earnest athlete who desires to make good in any kind of sport. Every boy knows that alcohol in any form is absolutely tabu. Smoking must be entirely avoided. Sexual incontinence is destructive to both the physical and nervous well-being

which strenuous training demands, and is always exceedingly dangerous because of the great likelihood of acquiring permanent disability from venereal disease. In addition to this, illicit intercourse is always degrading, and no boy of sound ideals will allow himself to be tempted in this way.

These, then, are the usual causes for going stale, and, if they are kept in mind by both the coaches and the athletes themselves, there is no reason why every man on the team and on the squad should not finish the season in excellent condition fully equipped to go to the limit of his strength in every event and acquit himself perfectly in the final test.

CHAPTER IV

MENTAL AND NERVOUS CONDITION

THE relation between mind and body is never so intimate as in athletic sport. The success of any game or event is immediately dependent upon it. The most important part of an athlete's job is in keeping this connection absolutely clear; allowing nothing to come between which may interrupt or confuse it in any way. It is like the electrical connection between the bridge of a ship and its engine; the moment it is broken, the control is lost and disaster is imminent.

Nervousness, depression, pessimism, worry, fear,—all these are interruptions which prevent the mind from exercising its proper control over the body. Overwork, fatigue, irregularity, indigestion, headaches, colds and general rundown condition prevent the body from obeying the mind's commands. Both sorts of interruption are equally bad in their

results, but they are so bound up in each other that it is often very difficult to discover whether the cause is physical or mental.

The old saying that a sound mind dwells in a sound body has been proved so often that it has become a platitude. But as athletes we must remember that the converse is equally true; a sane, healthy, properly balanced mind whose outlook is cheerful and courageous is the greatest possible aid to efficient physical work. In the first place health of mind is a large factor in keeping away bodily ills, because it does not expect them. A strong, happy mind never contemplates weakness because its interest is concentrated on strength. It becomes unconscious of ordinary physical discomfort and therefore does not suffer from it. A man who is wounded in battle or hurt in a football game is often quite unconscious of his wound because his mind is interested in something else. His injury is so insignificant compared with his goal or objective that he ignores it. He is often much surprised to see that he has been bleeding. The sight of the blood brings his mind back to himself and he begins to suffer pain. But during the time

that he has been unconscious of it he has been able to do work which would have been impossible had he been suffering physical discomfort. Furthermore the vitality which he has been able to keep up has greatly increased his body's resistance to the effects of the wound.

A morbid, self-centered mind is constantly courting pain. Continually dwelling on weakness, it is always in dread of bodily ills. By anticipation it increases the sensibility of the nerves to keen suffering. By quick, nervous flights of the imagination it greatly magnifies every discomfort. In time it lowers the vitality and renders the body liable to contagion. I have seen an epidemic of tonsillitis run through an entire team merely because the men had become discouraged by bad conditions and repeated failure.

But when we come to look for the causes of unhealthy mental condition we often find a physical reason. A boy who is overtrained, for example, sometimes cannot help being pessimistic because he never gets a chance to catch up with his strength. He goes to bed at night so tired that his sleep only half re-

stores him. Thus, in the morning, at the time when, normally, he should feel at his best, he has still much of the fatigue he had when he went to bed. Everything he does during the day simply adds to that exhaustion and the next night he has an accumulation from which it is even harder to recover. Naturally a man who feels himself daily dropping behind, who knows that the burden of his fatigue is getting always heavier, cannot see very much to be cheerful about. Fatigue is a definite physical poison which is produced by the breaking down of the tissues. If these are not repaired during sleep, the poison accumulates and eventually a man breaks down under it so that he has to stop all work for a time and take a prolonged rest.

If, however, the daily exercise is normal a man or boy recovers entirely during the night and gets up thoroughly refreshed in mind and body and able to tackle any problem that comes before him. There is a surplus of energy in the morning which carries with it a sense of ability to accomplish. Nothing seems impossible to the boy who has just got out of bed after a really refreshing sound

sleep. Things which the night before he had, perhaps, given up in despair, now seem easy. It is only necessary that something oppose itself to him in order that he may combat it. If nothing does so, he creates something. He must have opposition, something to work against, something to overcome. The greater the force of the opposition, the greater his fighting force becomes. If luck turns against him, his zeal increases in inverse proportion. A fit man is made a fighter by reverses. That is what in large measure determines fitness,—the acceleration of energy to keep pace with increasing opposition. In war, when an attack runs into heavy resistance, additional artillery, more machine guns, the “auxiliary arms” are brought to bear upon it. Reinforcements are sent for. If there are none of these things, then the attack fails. Fitness implies the abundance of these reserve forces and automatic reinforcement when it is required.

Physical fitness affects the mind in that it gives confidence and courage. A man who is really fit, naturally eliminates many of the fears and worries incident to daily life, such

as the fear of illness. The idea of illness never occurs to a man whose physique has great resisting power. Then he has a control of his body which gives him a certain calmness of nerves and allows the proper direction of his nervous energy. A man who has control and proper co-ordination of his muscles nearly always has mental poise. Muscular co-ordination means immediate obedience of the muscles to the commands of the brain and a constant adaptability of the muscles to suddenly changing conditions of direction, motion and strain.

Another essential of the athlete, which, more obviously than anything else demonstrates mental control of the body is muscular co-ordination. This simply means the immediate obedience of his muscles to his command—in short, the ability to make his body do exactly what he wants it to at exactly the right moment. This requires concentration, balance, alertness and quick adaptability. Take, for example, the center on a football team. While the quarterback is giving the signals he must concentrate equally on two things: his opponent and the passing of the

ball. If he becomes too absorbed in picking out someone in the opposing team with whose movement he must interfere, he forgets the ball and, in his haste to get at the man opposite, passes it too quickly. Again, take the man at the start of a sprint who is so concentrated on his start that he forgets the pistol and jumps it. These are examples of lack of balanced concentration or poise. In each case the man must be evenly poised between two impulses. If he swings too far one way or the other he loses his equilibrium and fails to do part of his job. With constant practice there comes a perfect mental poise which eliminates this danger and which, as it increases, so develops a man's nervous control that it helps him in any work he undertakes, whether on the field, in the schoolroom or in the business of after life.

Alertness and adaptability, which go hand in hand, are well illustrated by the man in the boat. If his mind is not constantly alert and both his mind and body able to adapt themselves instantly to an increased stroke, he will become rattled when the beat is quickened, and by catching a crab may throw out the

whole boat and lose the race. These are essential elements of team work; without them it is impossible for men to work together in any kind of athletic sport.

In the setting-up exercises which were given to the men in the services, this co-ordination was one of the most important objects. By means of various tricks on the part of instructors the men were kept in a constant state of mental alertness during the exercises.

For example, the instructor would give a command and himself execute a totally different movement. An untrained man though previously instructed to execute commands only as they were given finds it impossible to resist following the motions of the instructor. Again, an instructor after for some time giving his commands in a certain sequence, suddenly varies the sequence. Among untrained men he will catch the majority of the company. That is because their muscular control processes are unused to sudden changes of requirement. With a little training these deficiencies disappear and with the new co-ordination there comes a new mental poise. A man finds himself able to adapt himself to

unexpected situations. He is able to make quicker and better decisions. He is less easily embarrassed or taken by surprise. He is surer of himself. He is better able both to give and to obey orders. He is quicker in his thought and in his response.

Our American sport has been criticized because we specialize too much; because we devote so much of our time to some particular game to the exclusion of everything else. Perhaps some of this criticism is true; there is this to be said for our method, that it trains in the ability to concentrate. Our concentration on a sport cannot help benefitting the mental and nervous condition. A man who has been capable of the physical concentration necessary to carry him successfully through a football season has gained the ability to concentrate on anything in which he is actuated by a desire equally great.

There is no reason why a boy in school or college should not make use of his athletic work to help him in the classroom. If he makes a regular schedule of work and play, he can do this successfully. If he does his studying in odd moments during the day, his

school work is sure to suffer. If he studies in the morning on Monday, in the afternoon on Tuesday and in the evening on Wednesday and plays the rest of the time, he is unable to form any habit of concentration. He cannot study well on Tuesday afternoon because on Monday afternoon he was on the athletic field at the same time and his mind keeps going back to it. If he had studied in the afternoon on Monday and continued this through the week, his mind would soon have got into the habit of expecting study in the afternoon and concentration would have come easily.

There is nothing more important in any kind of athletic work, as, in fact, in any kind of training, mental or physical, than this regularity. Bodily fitness is absolutely dependent on it, and perfect co-ordination of mind and body is impossible without it. Definite times for exercise, bathing, eating, drinking, studying, going to bed and getting up should be established and rigidly adhered to. Naturally it should not be carried to the point of monotony. Infinite variety may be introduced into the details of the day's work, the

food, etc., but changes in time should be avoided, particularly in eating and sleeping.

During the training season it is inevitable that the nerves of the men on the team experience a good deal of strain and are therefore susceptible to many influences of which at other times they are less sensible. Little incidents may occur during a game which will destroy a man's confidence and weaken his efficiency. For example, a man who has run a ball down the field loses it by a fumble on the five-yard line. He is convinced that the fumble was caused by unfair work on the part of someone on the other team. If he is allowed to persist in this belief it will influence his play during the rest of the game. He will fail to do his best because he will feel that whatever he accomplishes will be thwarted by dirty play which will be unobserved by the referee.

Here is a case where the coach can give the most valuable assistance. During the intermission he must convince the man that his explanation of the fumble is no possible excuse. He must point out to him the fact that he got the ball as far as the five-yard line

before the accident occurred, and that it will be perfectly possible for him to do it again and that to justify himself he *must* do it again.

Innumerable little things affect the nerves of the players during a game. Long delays are always bad for the nerves. Unfair play or real or supposed unfair refereeing are generally demoralizing. False starts in track are nervously tiring. In baseball there are a number of superstitions which, whether groundless or not, have a definite psychological effect.

But it is a curious thing that most superstitions, however absurd they may be, have, if we can sufficiently trace them back, an origin based on reason. Even the old superstition about crossing a funeral, which now seems to have no real connection with bad luck, began during one of the plagues in Europe when the bodies were carried through the streets and there was danger of contagion to anyone who went near them.

The popular belief that it is bad luck for a team to start putting away the bats before the game is over is based on the real psychological

effect that this has on the players. It gives the impression that the game is as good as over and implies a suggestion of impatience and hurry which tends to make men careless. The theory that it is good for a batter to swing two or three bats before he goes up is more than a superstition, and in many cases increases a man's confidence in the same way that putting a shot helps one to throw a baseball.

The psychological effect of bad conditions at meals has already been mentioned; it cannot be over-emphasized. Untidiness, flies, badly cooked or half-cold food; heated discussions during meals and the constant harping on the same subject are trying to the nerves of men in training and, if allowed to continue, may cause the failure of a good team.

The object of this chapter is to show how closely the mind and the body are related in all athletic work and that the mental troubles must be removed by attacking their causes. In general, if the strength is conserved, strenuous effort worked up to gradually, and healthful habits regularly followed, a bodily fitness will result which will defy mental de-

pression, nervous breakdown, worry and pessimism, and a fund of mental and physical energy will be created which can accomplish anything. Successful athletics depend on the combination of sound mind and sound body, and these two things are intimately dependent on each other.

CHAPTER V

TAKING CARE OF INJURIES

THERE is no athletic sport in which injuries do not occur. They may come purely by accident, they may be caused, as in baseball, by coming up to the hard work too suddenly without preliminary strengthening exercises; or, as in football, from ignorance, insufficient practice or lack of confidence. Whatever the cause or degree of seriousness every injury should have immediate attention. If this is done serious trouble may often be entirely prevented.

It is extremely important to report all injuries, no matter how insignificant. The slightest abrasion of the skin such as a cut or scratch on the hand or foot may easily become infected and cause blood-poisoning and serious incapacity, whereas simple treatment with iodine or other equally powerful disinfectant and bandaging, if it is done immediately, will kill any infection which may have

already penetrated, and prevent further danger.

Sprains are the commonest trouble. A sprain comes from any wrench or twist about a joint. The ankle sprain is perhaps the most usual form. A good deal of pain is followed by swelling and "black and blue" discoloration. Hot water—the hotter the better—is the best treatment and should be frequently applied by cloths for about an hour, after which the joint should be bandaged and kept in an elevated position. Like all other injuries, sprains should be treated by the physician if he is immediately available; if not, the above "first aid" may be used until he can be reached.

The physician who has the athletic work in charge is especially equipped to cure injuries in the shortest possible time. The old theory of rest and quiet as a cure-all for injuries is not rapid enough for the present-day athlete, to whom every day of training is so important, so the modern athletic surgeon has perfected a number of quick methods of treatment which are equally effective (though somewhat more strenuous) and do not keep a man out of the game any longer than is absolutely

necessary. For this reason it is important for a man to report his injury without delay that he may get this quick care before it is too late and he finds himself incapacitated for a long period. The idea that "it will get well all right by itself if I go easy for a day or two" often leads to going easy for the rest of the season and making yourself a dead loss to the team.

Trying to care for one's own injuries, either in the belief that one can do quicker work than the doctor or in the fear that he may order a rest sometimes leads to trouble. I remember a boy who, having discovered chloroform liniment and used it with good results for bruises or sprains, came to believe it a panacea for all injuries. The next time someone got hurt in a football game he immediately recommended his newly-found remedy. Unfortunately the victim of his well-intentioned treatment happened to have abrasions of the skin as well as bruises and the awful effects of it were evident to everyone within hearing. The old saying that a little knowledge is a dangerous thing is particularly applicable to athletic injuries.

The damage an injury may do depends largely on the nature of the sport and the time when the injury is received. A man who throws out his shoulder during fall practice in baseball can recover for the spring work. A man who is injured in football will be unable to go back during the season if the injury is at all serious. Sports like football and hockey have such short seasons that they give a man little chance to get back. Of course an injury received in one sport does not necessarily incapacitate for another. For example, a man with hands sore from rowing may play football. A man with a slightly abraded foot may row in a boat, and a "glass-arm" pitcher might take part in certain track events. Of course the most serious injuries usually incapacitate for everything and the only remedy is a long rest from physical work.

Injuries to the knee are, from the athletic standpoint, the most incapacitating. The wrenched knee which football players experience more frequently than any others should be treated by a doctor from the very first if one is available. If there is delay in getting

the doctor the knee should be treated the same as a sprain with hot applications and then bound as tightly as possible. It should not be further strained under any circumstances. A bad wrench will generally necessitate the use of crutches for a while and may result in a severe case of water on the knee, which sometimes leads to being permanently crippled. That is why it is so necessary to give any hurt to the knee immediate and expert attention. Another knee injury which is not unusual and which sometimes requires an operation is floating cartilage caused by a small piece of the cartilage being torn loose by a sudden violent movement. This is generally followed by severe pain. The displacement must be immediately remedied by gently rotating the leg. An operation may be necessary to remove the floating fragment.

The ordinary muscle strain may easily be cured in a few days. It should be thoroughly massaged and then exercised moderately as soon as possible. Runners often experience strained muscles at the beginning of the season, which cause pain along the shin bones and often between the bones of the foot. Both

of these may come from running on a hard track or overworking too early. The former is a strain of the extensor muscle of the lower leg. A day's rest and hot applications are the best remedy. The pain in the foot which is caused by a strain of the ligaments which bind the metatarsal bones is not serious and may be due to tight shoes. Soaking in hot water generally gives relief.

Pulled ligaments or pulled tendons may be serious. Of the two, the pulled tendon is the more important. It may come from any violent twist or wrench. It may occur in the thigh, biceps or ankle. The first is the most common, especially in track athletics and is a rupture of the semitendinous muscle. It will generally cause a man to fall if it occurs while running. It will require about three days in bed, the leg strapped with adhesive tape. Hot water bottles and daily massage are helpful. No man who has pulled a tendon should run again in a race inside of two months. The "Achilles" tendon in the foot is sometimes ruptured by track men. The treatment is a tight strapping of the ankle.

“Charley-horse” is a bruise of the sartorius muscle in the front of the thigh. It is painful but not serious and should not keep a man out of work. Iodine, antiphlogistin, and massage are all good. Capsicum vaseline has the effect of a counter-irritant and will often cause a man to forget the pain of his “charley-horse.” It is a good plan, if the man is to go into scrimmage or dummy tackling, to protect the bruised muscle by a pad or otherwise against further injury.

Sometimes a man will have some injury or deformity which is chronic. He may have a displaced cartilage which, having become chronic, has ceased to be sensitive although it is still likely to slip out of place. In a case like this a man can sometimes play on a team without suffering any pain from his disability although it is always a weakness and is likely to incapacitate him at any time. It is advisable, therefore, not to use men with chronic injuries of this sort if they can be spared. There can be no doubt of the value of massage and osteopathy, if properly done, in the treatment of athletic injuries and in general conditioning. But massage, to be effective, must be done by

a professional who has had sufficient training. It must not be confused with rubbing such as is done by trainers. It is a scientific treatment which requires a thorough knowledge of anatomy. I have known remarkably rapid and complete cures of sprains, muscle strains, etc., by expert massage treatment, taken in time and thoroughly done.

Osteopathy is a system of treatment which depends on the theory that by proper manipulation of the bones any displacement or deformity may be rectified. The osteopaths ascribe most diseases to such deformity, and in many cases they have succeeded in positive cures. Athletic injuries in particular are susceptible to this treatment.

College athletics are generally presided over by a triumvirate consisting of the physician, the coach and the trainer. The physician has general charge of the health of the men and all treatment for illness, injury and accident. The coach has charge of the technical side of the game, superintends the daily practice and lays down the method or system to be followed in all work. He picks the men for the team, decides on the position each man shall

play, and is, in large measure, responsible for the performance and success of the team. The trainer has charge of the condition of the individuals on the team, watches their daily performance, prescribes special work according to individual requirement, regulates the diet, has charge of the rubbing of the men, etc. It is the trainer's duty to watch for signs of "going stale," to lay off the men who need rest, and give specific exercise to men who are undeveloped or deficient in some particular detail of their work.

It is immensely important for the success of the team that these three shall work together in harmony. There is sometimes conflict in judgment between the trainer and the coach as to the work a man should do. The natural tendency is for the coach to want all his men on deck for every practice, whereas the trainer often inclines toward resting up certain men in order to help their general condition or because of some injury. If the two are naturally uncongenial, and have little confidence in each other, conflicts of this sort will keep occurring and such differences in judgment are sure to disturb the men on the team

and weaken their confidence in both coach and trainer. If, on the other hand, they work well together, each will trust the other to do his part of the work and each will remain within his own province. In order to warrant this trust the trainer must be careful always to act according to his own judgment after careful examination and not submit to the judgment of the men. In this way he will avoid the frequent accusation by coaches that trainers are letting the men "put one over on them."

Epidemics often spread rapidly among teams, especially when the team is stale or overworked. Tonsillitis is one of the commonest forms of epidemic because it is a disease to which anyone suffering from fatigue is peculiarly susceptible. Influenza is another epidemic which, especially the last few years, has attacked football teams. The best method of controlling an epidemic is by immediate isolation of the first cases as soon as the symptoms appear. If the other members of the team are in good condition a very slight exposure will not affect them. The chief danger lies in concealment of their illness by

the men until after the germs have been spread.

Good general hygiene and careful avoidance of infection are the best preventives. Too much emphasis cannot be laid on cleanliness; daily bathing by shower if one is available, otherwise by tub or sponge bath. The object of the bath is to remove the particles of skin which it is part of the process of nature to throw off, to keep the pores from becoming clogged so that perspiration is retarded and the body is not able to get rid of its waste products, and to start the circulation. This last is accomplished largely by the rubdown which follows the bath. This should always be vigorous. One should never fall into the habit of merely drying oneself after a bath. The hard vigorous rub should be real exercise in itself and should leave the body glowing from head to foot.

Athletes—especially schoolboys whose training is often less carefully watched than that of college men—sometimes fall into the bad habit of staying too long in a warm bath. This is very weakening to the entire system and renders one susceptible to infection from

germs, and if the temperature of the room is cold or if the boy goes outdoors soon after, he is almost certain to get chilled and catch a cold or sore throat.

Great care must be taken to see that there is always a plentiful supply of clean towels on hand so that each man gets a clean towel. If it is impossible to provide a clean towel for each man every time he bathes, it should be insisted on that he keep his own towel in his locker, and never use one which has already been used by someone else. Bad habits of this kind soon get started in school dressing rooms unless carefully watched, and boys use towels promiscuously and without much regard to their cleanliness. This is likely to result in the spread of a peculiarly unpleasant skin disease—a sort of itch—lowering to the tone of the team because it keeps the men from sleeping and reduces their general sense of self-respect and well-being. The same disease may come through wearing other men's jerseys, shirts, drawers, suspensories, etc., and this should be avoided at all times. It is also important that a man's running suit or underclothes and socks be frequently washed. This

is especially necessary for socks to avoid sore feet.

Foul air, that is air that has already been breathed, besides containing an insufficient supply of oxygen, is sure to be full of germs. Ill-ventilated rooms should be avoided especially at times when the body is fatigued and the resistance low. Going to the "movies" in the evening may be dangerous. The body is tired from the day's work and is peculiarly susceptible to contagion from foul air. Unless the theater is well ventilated, the air is generally pre-breathed and largely exhausted of its oxygen. This is also true of crowded street cars, subways—in fact, any crowd should be avoided as far as possible. So in the week or two before the big contest such exposures are risky.

Colds are the bane of most people's existence especially in the winter, but they should not bother the athlete if he takes care of himself and keeps in good general condition. The air baths mentioned in the first chapter are a good defense against colds, as they render the body less tender. Tight collars, mufflers, superfluous clothing, too many bed-clothes, sleeping in a stuffy room, all these

are contributing causes of colds. Sitting in wet clothes or shoes is chilling, although both may be worn indefinitely as long as the body is moving and the blood kept in circulation. No man has ever been harmed by wet clothes so long as he kept exercising, but sitting in them, or sitting in underclothes wet from perspiration after exercising, is dangerous and one of the things which must be watched by coaches and trainers.

Never forget the teeth; they are one of the most frequent sources of digestive trouble. Teeth in which decay is going on contaminate the food which is taken into the stomach. Besides this, one is likely to lose his teeth at an early age if they are not cared for. Caring for the teeth means brushing them and having them examined and filled by a dentist. The teeth should be brushed on getting up in the morning, just before going to bed at night and after each meal, though powder or paste should only be used once a day. A dentist should be consulted every six months. Never wait until a toothache makes it necessary.

If the rules given here on general hygiene are followed, as well as those on diet and sleep

in the chapters which follow, the danger of disease by contagion or infection will be greatly reduced. If reasonable precautions are taken, many of the injuries described in this chapter—particularly muscle strains and the “glass arm”—may be escaped. The precautions are merely those of beginning practice gradually and using a certain amount of calisthenic exercise to make the muscles strong enough for the work.

Many of the injuries are, of course, unavoidable and I should not want to tell a man to try to avoid them, especially in football, as that would be one of the surest ways of causing them. A man who goes into a football game with the idea of trying to avoid injury is almost certain to get hurt. Fear of injury is the first weakness a football player must conquer.

The only way to play football (or any other athletic game, for that matter) is to play it hard for the game's sake with full confidence in yourself and your team and no thought in your mind of danger—or defeat. If you have fear (as most men do), control it. Controlled fear is as valuable in athletics

as natural fearlessness and far more valuable to the athlete's character. A normally healthy boy who keeps his condition good and his mind on the game, plays hard and obeys the orders of his coach and trainer, should be able to finish his athletic career with little injury, sickness, or anything but healthful effects.

CHAPTER VI

DIET

THE subject of diet has been so discussed and rediscussed and theorized about that if one tries to study it carefully he soon becomes confused by the conflict of dietary creeds. In athletics diet has gone through a long series of changes and has probably arrived at its healthiest stage. The present generally accepted theory is that if a diet is simple and nourishing it need not be much restricted. Of course there are many believers in vegetarianism and cereal food, and while sometimes men seem to succeed in certain kinds of strength tests under this kind of diet, it has never had any vogue among that now expert class with us, the athletic trainer. It has always seemed that if a man were not intended by nature to eat meat, he would not have been endowed with such a strong natural desire for it. Also, while good results have been obtained in work with dumb-

bells requiring considerable endurance by the use of strict vegetarian diet, many have questioned whether it gives men as much of what we call "pep"; ready energy, alertness, speed and constant desire for activity.

Years ago meat formed a far larger part of the athlete's menu than it does today. At most of the training tables of that day there were almost no vegetables except rice. The meat was generally cooked very little, the idea being that "raw meat" was strengthening. Almost no liquid was permitted. The worst suffering of the training season was caused by the almost constant thirst the men had to endure. What water they were allowed contained oatmeal. Sweets of all kinds, everything, in fact, containing sugar, was forbidden.

The evils of this diet became evident when it came to be more carefully studied. The lack of vegetables and fruit predisposed to constipation, the lack of water caused loss in weight and exhaustion, and the tabu on sugar removed a valuable stimulant. Furthermore, the meals were so unattractive and had so little variety that the men ate little and, as

a consequence, were under-nourished. Besides this, they did not provide at all for individual differences of taste and idiosyncrasies (for "one man's meat is another's poison"), because there was so little choice.

I remember visiting a university a number of years ago in the middle of the football season. I noticed that the team generally went to pieces in the second half; the men showed signs of exhaustion, lack of energy and interest in the game. I immediately turned my attention to the training table. I noticed in the first place that the room was unpleasant, the table untidy and not clean. The food was inadequate. For lunch, for example, the men got nothing but cold roast beef and oatmeal water. I saw that they took no pleasure in the meal and that some of them left a good deal of their meat uneaten on their plates. The day of the next game I advised a change of menu. It included a nicely cooked mutton chop, baked potato and ice cream, and was decently served. The effect on the men's spirits was immediate. They ate heartily and with pleasure, the conversation was cheerful and they got up satisfied,

optimistic and ready, mentally and physically, for the game. The game came out successfully and, under the changed régime which followed, the rest of the season was satisfactory and the team "came back" with a strong finish.

Napoleon said that an army moves on its stomach; it is as true of any athletic team. Under-nourished, hungry men lose their endurance and, what is nearly as important, their good disposition. A man who is discontented with his food soon becomes discontented with everything; loses his optimism, cheerfulness and ability to overcome obstacles and resist opposition. The irritating, fretful discontent that comes from a poor diet points the inevitable way to failure.

College athletics have developed a class of experts who are known as trainers. These have come to see the error in the old methods and to realize that an average man in good condition can eat most simple foods without danger and, in his eating, needs only to avoid excesses. Overeating, crowding the stomach with more than it can digest in a reasonable time, causes a man to go out on the field with a mass of un-

digested food in his stomach which does not help his day's practice. Conversely the practice still further impedes his digestion. Eating too much sweets, especially if taken in the early part of the meal or between meals, is bad for digestion and causes a loss of appetite for the other, more nourishing food. An athlete should remember that nutritive value is not necessarily dependent on quantity. The dietitians have figured out a system of calories to show the relative fuel values of various foods. Some of the results have been interesting. For example, it has been found that a lunch consisting of twelve crackers and a pint of milk contains as many calories as one which includes consomme, roast beef, potato, peas, stewed corn and sliced pineapple. It is on results like these that some men have based vegetarian theories. A lunch of crackers and milk is an excellent one for the business man who sits in an office and whose life is sedentary, but for the man who is undergoing intensive training for hard physical work it is not sufficient.

There is a dietitian in most colleges who can easily work out a menu based on

the proper amount of calories and vitamins.

In discussing the disadvantages of the old "raw meat" diet I mentioned individual idiosyncrasies. This is an important consideration and the menu should be large enough to provide a choice for everyone. For example, there are some men who cannot eat strawberries without ill effects. Such a man should be able to have some other sort of fruit as a substitute and not be deprived of the benefit the other men are getting from the fruit juices. There are others who cannot eat onions; peppers and cucumbers are poison to many people. If there are always more than one vegetable, a man does not have to go without entirely because of his individual peculiarity.

Fruit is one of the most valuable articles of diet, raw or cooked, fresh or preserved. It is a valuable aid to the proper functioning of the intestines and contains acid and sugar in good proportions and provides the natural salts the body requires. Prunes may be eaten profitably at any meal; they are particularly good at breakfast, but they have been so over-

worked that they are hardly popular with the men except semi-occasionally.

As I have already mentioned, soiled table linen, plates, knives and forks insufficiently washed and all evidences of untidiness make meals unappetizing and are not good for the disposition. The presence of any sort of vermin, such as cockroaches, water-bugs, etc., in the dining-room is always unpleasant, and flies are not only irritating but dangerous in spreading disease. The dining-room should be large, light and well-ventilated (the latter is especially important), and as free from cooking smells as possible. The tablecloth and napkins should be frequently changed. If this is not practicable, it is better to serve the meals on a bare table.

Right drinking is extremely important. From eight to ten glasses a day are essential to good health, especially if exercise is frequent. It assists the excretory processes—that is, the carrying off of waste by means of the skin, the kidneys and the bowels. Most of this should be taken outside of meal-times—not that food will not digest when mixed with water, but athletes are likely to drink ice water

with meals and really to wash down every mouthful of food.

Of course it is hard to lay down an absolute rule against drinking water at meals. There are times when it may be necessary. For example, suppose a team is off on a trip and is unable to get a drink during the morning. They lunch perhaps at a hotel and the waiter fills their glasses. They are thirsty from the morning's train ride and naturally want to drink. Under these circumstances it would not be advisable to prevent them from doing so. But on the whole it is wiser to drink very little with the meals. This is not, as used to be supposed, because the water dilutes the digestive juices and makes digestion more difficult; it is because if a man drinks a lot of water it fills up his capacity and he is likely to eat less. In this way it deprives him of some of his nutrition. Under no circumstances should the water be iced but should be taken at the temperature of the room.

Hurrying at meals must be strictly avoided. It is sure to cause indigestion and rob the meal of much of its nutritive value. The stomachs of some animals are so constructed

that they can digest bolted food, but the human stomach demands proper mastication and salivation and will simply pass on unchewed food to the intestines, which carry it off in its undigested state. This prevents nutrition from the food and often causes pain in the stomach and intestines, clogging of the passages and, if it is not properly eliminated, may cause auto-intoxication. Starchy foods such as potatoes and many other vegetables, bread, cereals, etc., are acted on by the saliva, which has the effect of converting the starch into sugar, the first stage in the digestion of this food. Thorough chewing helps this process and is therefore necessary to complete digestion.

Another effect of hurry is the nervous effect. Any upset or restless mental condition at meals is sure to arrest digestion. This is why it is so important to keep a cheerful atmosphere during meal-time and especially to prevent heated arguments. There is probably no subject on which arguments can wax more violent than athletics, and as boys nearly always take athletics very seriously and are intense in their interest, most discussions

of this sort which arise among a group of them soon reach the boiling point.

Arguments in which there is strong feeling nearly always destroy the appetite during a meal and hurt the digestion. It is a common thing to see a man get up after a violent altercation of words leaving his food untouched on his plate. He has lost interest in it, his system in its excited state rebels against it. If he should force himself to eat it his digestive functions would probably refuse to work upon it.

Anger produces a definite poison in the system which often results in illness. But the effect of it on the digestion is to cause temporary cessation. This causes food to be passed into the intestines before it is ready for them, thus impeding the natural movement of the bowels and generating toxins. It is undoubtedly the most harmful of all the emotions.

This chapter on diet has been intended primarily to show that the old ideas of what an athlete should eat are, for the most part, exploded and proved to have been wrong; that the average healthy boy can eat almost anything in moderation and need only avoid ex-

cesses and irregularity; that how you eat counts more than what you eat, and that psychological influences on the digestion are too immediate and important to be ignored. The boy who eats at regular hours, drinks little with his meals but much between, is surrounded during meal-time with cleanliness, light and air and congenial companions, who never eats between meals and never "stuffs" himself, need not worry about the details of his diet.

Although the point has already been brought up, the question of eating between meals and especially filling up on sweets, candy, soft drinks, etc., cannot be too much dwelt upon. This applies not only to the training season; it is nearly as important at all times of the year. It often happens, especially among schoolboys, that when the season stops, the members of the team who have been keeping strict rules of diet, etc., feel it incumbent upon them to break training as violently as possible by an orgy of sweets, pop, soda fountain drinks and candy. If they continue for any length of time to indulge themselves in this way and their eating becomes irregular,

they will so break down their digestion that it is very likely they will not recover by the following season. Some boys have incapacitated themselves for life by dissipation of this kind, bringing on diabetes, ulcerated stomach, chronic indigestion and many other diseases. The warning to avoid this cannot be taken too seriously.

It is customary in some colleges for the men to "eat round," especially in the Freshman year, before they become a member of any fraternity or club; that is, they do not sign up definitely at any one eating place. The result is that most of their meals are eaten at the various lunch counters with which college towns generally abound. The food is almost always good at these places and cleanly and attractively served. But there are a number of serious drawbacks to this kind of living, and they generally so tell on a man that he is obliged, after a few months' trial, to give up either the lunch rooms or his health. In the first place, if you eat at these places you generally have no regularity of meal hour. You are likely to eat rapidly because there is always an atmosphere of noise and

hurry, and the seating accommodations (if any) are usually not particularly comfortable. Then there is a tendency to eat mostly cold food such as sandwiches, salads, pie, ice cream, or "hot dogs," and other rich and indigestible dishes. But the food itself is not the great disadvantage of this method. It is the irregularity, the lack of habit, the constant change, the hurry, the psychological effect that causes the trouble. No athlete who expects to achieve real success should ever allow himself to fall into this habit—or lack of habit—even out of training season. It is certain to weaken his vitality and undermine the foundations of his health.

CHAPTER VII

SLEEP

OF all the factors in making a successful athlete and keeping him in trim, none is more important than sleep. A man may keep training rigidly in other respects; he may limit his diet, regulate his exercise and his personal habits with the greatest care, follow the most approved methods and work under the most expert coaches and trainers; with insufficient sleep he will be unable to finish the season. The effect will be not merely a nervous or mental one, it will be a wearing away physically, loss of weight, inability to perform the required work, piling up of fatigue poisons in the system, and, in the end, going stale.

Primarily sleep repairs. During the day there is an excess of waste. The combustion, circulation, movement and friction of the body cause accumulations of burnt-out fuel, impurities and the wearing away of parts

exactly as in an engine which operates continuously for long periods. The engineer must, every little while, slow it down, oil it, overhaul and repair certain parts, shake down his furnace, etc. The same is true of the body. During sleep the human engine slows down and is repaired, the blood purified, certain waste matter removed and certain parts built up where they are broken or worn.

During sleep more oxygen is absorbed but the heart beats more slowly. In this way the blood becomes purified but its pump is able to rest. The work of the stomach and intestines, while it continues, is slower. The skin excretes waste matter through sweating. The acid which is created by the working of the muscles, and which in time will so accumulate that it will stop muscle movement entirely, is eliminated in sleep. Tissues broken down by the wear of the day's work are repaired. The fatigue poisons in the blood are got rid of.

These details are given simply to show that there are certain very definite functions which sleep performs in the body and that these functions are more important to the athlete than to anyone else, because they are the func-

tions which are essential to bodily fitness. It is the athlete's primary object to be at all times capable of exerting his physical power to the utmost in the most efficient manner, with the least friction. No automobile racer would think of taking a car into a race whose cylinders were clogged with carbon, cooling system stopped up with mud and gasoline supply full of water. No more should an athlete enter a race or game with his blood full of the waste products of fatigue.

In the matter of sleep, age is an important factor. The younger a boy is, the more sleep he should have. This is because he is growing and growth depends more on sleep than on anything else. It is during sleep that most actual growth takes place. After a boy has got his growth he can get along with less sleep, but he must not anticipate or misjudge this point. Many boys believe that at sixteen or seventeen they have got their growth because they are as tall as they believe they ever will be. They do not realize that, having attained this height, nature requires a great deal of time to adjust the rest of the body to it and fill the boy out in his proper proportions, as

well as to give him a chance to recuperate from the effort of his growth in height.

At seventeen nature demands nine, or better, ten hours of sleep every night. If the boy is in training for any kind of athletic sport this amount of sleep is essential to his success. Yet this seems to be the thing there is the greatest tendency to neglect. A boy will often be strictly careful of his diet and conscientious in his work, yet stay up at night far into the time which belongs rightfully to sleep. Another thing boys are weak in is regularity of sleeping schedule. The greatest benefit from sleep comes in making it a habit, running it on schedule like the various details of the day's work, so that the body gets sleep at the time it expects it. A boy who keeps his sleeping habits regular will have little trouble with insomnia.

This brings us to a point that generally comes up after mid-season. The first part of the training period the men generally rest well. The game is in its early stages; there has been no strenuous competition, no important event. In the latter half of the season, on the other hand, there are many disturbing

influences. Natural worry connected with the big contests begins to interfere with sleep. Nervousness, fear of the men lest they fail to do their job properly, worry over classroom work and countless other mental anxieties tend to keep the men awake and tossing in bed, far into the night. A boy whose imagination is vivid and active will often picture elaborate and impossible situations to himself when he is lying awake at night and will follow a long train of thought with intense seriousness through a series of imaginary incidents which he would laugh at in the daytime. He will frequently picture himself playing in a game or running in a race and either winning conspicuous success or falling down in outrageous failure.

The worst of this sort of worry is that it keeps the mind so constantly excited that, instead of lying quietly in a relaxed state, a boy generally keeps his muscles rigid, changes frequently from side to side, tries a dozen different positions, and is generally restless and uncomfortable. Thus he robs himself of that rest which, even without sleep, he would get if his mind and body were quietly relaxed.

This is an important point to remember, that lying still with the muscles relaxed is an exceedingly valuable rest to the body. It is often possible consciously to relax the muscles, and this process is generally conducive to sleep.

Of course at times like these outside irritations have a good field to work on. Noise, street lights or moonlight shining on the face, men talking in other parts of the building, people going up and down stairs, mosquitoes, a hundred little things which ordinarily might be unnoticed are peculiarly nerve-racking to a troubled mind. We all know how it feels when, after much tossing and turning and worry, we have finally composed ourselves, relaxed, and sleep is on the way, to hear suddenly the buzzing of a mosquito close to our ears. If these things are allowed to annoy men in training, it is quite inexcusable because they are easy enough to avoid.

Most school and college dormitories are not on busy streets and street noises anyway are not generally causes of annoyance to people who are used to them. Noise in the dormitory can certainly be prevented by proper enforce-

ment of discipline and by impressing on the others the necessity of sleep for the team. If it cannot, the men should be removed to another building where they can be by themselves. Mosquitoes can be kept away by screens or mosquito bars such as are used in the Army or camping, which can be obtained at any Army and Navy or sporting goods store. The only objection to these is that, fitting as they do, closely over the bed, they keep a certain amount of air off the bed. This is really better than being troubled by mosquitoes, for in the latter case a man is generally obliged to defend himself by pulling the sheet over his head which causes him to breathe pre-breathed air. The mosquito bar should be the last resort; if the screens are effective without it, so much the better. Flies in the early morning in the spring season are another cause of annoyance and curtail sleep. These can sometimes be avoided by keeping the room dark. Lotions, etc., which claim to drive away mosquitoes and flies are generally quite worthless and more unpleasant than the mosquitoes because of their disagreeable smell.

There are many other discomforts which,

slight as they might seem, at other times are well to eliminate during training. Among these are short sheets, badly made up beds, uncomfortable pillows, sheets not changed often enough, creaking beds, too much light, not enough air, etc. Sleeping naked or in the underclothes are both bad; the first because of the danger of getting cold, the latter because it is not clean. There has been some discussion as to the best side of the body to sleep on, but this makes little difference except that sleeping on the back generally causes uncomfortable dreams. Too many bedclothes is weakening and makes the body tender. A man who is constantly troubled with restlessness should be put by himself and not made to sleep in a dormitory with other men where such sounds as snoring or men talking in their sleep are likely to keep him awake.

Fresh air is immensely important in sleeping quarters—all you can get of it; it makes no difference how cold it is. It is easy to keep warm even in mid-winter with proper covering. To sleep in a room with the windows shut is robbing a man of one of the most

important benefits of sleep, the purification of the blood by the oxygen he takes into his lungs. Then it causes him to breathe again air that he or someone else has already breathed; in other words he is obliged to take into his body poisonous matter which has been rejected. The lungs are as much a part of the excretory system as are the kidneys, the bowels and the skin; they all throw out poisonous and waste products which the body cannot make use of. If we allow these poisons to enter the body again in a still more concentrated form we are injuring and insulting our organs. This is just what we are doing when, instead of taking fresh air into our lungs, we breathe the carbon dioxide gas which they have just rejected.

Breathing through the mouth is a bad habit which generally comes from adenoids, enlarged tonsils, chronic catarrh or other physical causes most of which can be removed by simple operations or treatment. Our nose was given us to breathe through and is especially equipped with means for preventing impurities from entering the lungs. Some animals, such as the horse, for instance, can-

not breathe except through the nose. Breathing through the mouth when asleep is the principal cause of snoring. It also causes uncomfortable dryness of the mouth and throat. Spraying the nose before going to bed with an atomizer or nebulizer and oil spray will make it possible to breathe comfortably unless adenoids are present. Even such heroic measures as putting adhesive tape over the mouth are often used with the result of forming a nose-breathing habit.

It would be a good thing, of course, if we could strike at the root of the whole insomnia trouble and eliminate the worry that keeps men awake. But this is not easy to do. It is the simplest thing in the world to tell someone not to worry, that worry is useless, that man is more efficient without it and the thousand other platitudes we hear every day. There can be no doubt of the bad effects of it: we have seen some of them in the chapter on nervous and mental condition and something of its effect on digestion in the last chapter. But to tell a man not to worry does not prevent him from doing so. He may not have complete enough command over himself

to be able to control his thoughts at will. Yet there are a few simple rules which, if followed, predispose the mind to relaxation and tend so to induce sleep that small worries are easily kept out.

First: never go to bed immediately after studying. A mind which, for several hours, has been tackling difficult problems has got so in the habit of it that it tends to keep on doing the same thing. When there are no more problems given to it, it begins to create them for itself. There are many boys who, after worrying for several hours over some particularly complex work in geometry or algebra, give it up and go to bed with angles and equations dancing before their eyes. Sleep comes late to boys in this condition. They may not continue to pursue their particular problem. They may start, in imagination, cutting a baseball diamond into triangles and applying theorems to them. Thence they get on baseball and athletics and worry begins.

A heated discussion just before going to bed is sure to persist in a boy's mind and keep him wakeful. He thinks of all the convinc-

ing arguments he might have used, becomes impatient because it is too late; then restlessness sets in and sleep is miles away. If his discussion has ended in angry dispute he works himself up into an even greater rage and makes plans for getting even with his opponent in some way. The more he thinks of it the angrier he gets. This is the worst possible condition to go to bed in because anger not only keeps away sleep but is very weakening to the entire system, and may result in partial incapacity the next day if it is allowed to go too far.

Of course it is inevitable that such things occur. A boy has to study in the evening and it is, really, the best time for him to do it. Arguments are more likely to occur in the evening than at any other time. But the point to remember is that just before going to bed a little time should be taken to quiet down and relax the mind. A quiet friendly game of some sort which takes little mental effort—not bridge or chess—is the best thing for this sort of relaxation. Reading a light short story is good preparation for sleep; better than a novel be-

cause it can be quickly finished and there is no sense of suspense in leaving off.

There are countless other causes of insomnia; healthy boys are less subject to them than older people. Among others are indigestion, constipation, after-effects of dissipation, excessive smoking, etc., etc. One thing which has already been mentioned would not be out of place if repeated here, and that is the care of the teeth. Many a boy has been kept awake for several nights in succession during the hardest part of the season by a toothache, which would have been avoided had he not neglected the dentist examination which should be made every six months. Bad dreams, while not exactly part of insomnia, are detrimental in their effect because they prevent sound sleep and cause an agitation which interferes with the processes of repair. They are generally the result of indigestion, lying on the back, cold or any unnatural condition.

I hope the athletes who read this chapter will take it to heart and realize how much the observance of the regular sleep schedule has to do with successful sport. Sleep is less easy.

than diet and other details of training to enforce by discipline; therefore every athlete should make it a conscientious duty of his own for the sake of his value to the team.

CHAPTER VIII

EXERCISE AS DISTINGUISHED FROM PRACTICE

ONE of the first things for the athlete to learn is the distinction between exercise and practice, and he should realize the value of exercise as a preparation and to supplement his practice in whatever form of sport he goes in for. Exercise is work outside the game itself which is intended to build up the muscles or to develop the endurance which the game requires. Practice means going over and over the details of the sport itself. For example, the tennis player's exercise consists in compressing an elastic ball in his hand to strengthen his forearm; his practice consists in rehearsing the strokes of the game until he perfects himself in them. Knack, judgment and skill are the results of practice. Endurance, suppleness and bodily efficiency come from exercise.

In the conduct of sport in this country the

exercise phase has been too much subordinated. We have expected a man to get his exercise through playing the game itself. We have made too little effort to prepare him for his practice beforehand by first seeing that he has a solid foundation of good general condition and then, by exercise, preparing the particular muscles which he will make use of in his practice. If the engine of the man is right and his general condition good he can be taught all the rest. The main point, after all, is efficiency, and efficiency in athletics means being well and supple. So our exercise divides itself into two classifications: general exercise, for conditioning, insuring health and suppling the body all over so that it is prepared for any kind of sport, and special exercise applied to particular muscles in preparation for a particular form of athletics.

The reason why so little value has been placed upon set-up exercises is because, as a rule, they duplicated much of the work of the daily practice. This, of course, was because most calisthenics have been applied largely to the arms and legs and it was thought that development of these muscles of legs and arms



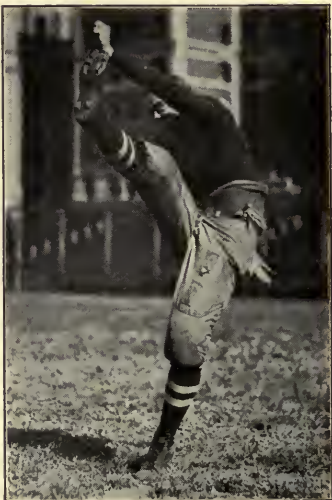
BATTLING NELSON.

Showing smoothness of development and
absence of knotty muscles.



***HAMMER THROWER.**

Showing suppleness and necessity of loin
muscles.



TWO PHOTOGRAPHS OF FOOTBALL PLAYERS.

Showing poise and suppleness.

was the essential. But a new light is dawning on the horizon of athletics in this respect; trainers are coming to realize that the best foundation for an athlete is a development of the main muscles of the body,—of the trunk, chest and back. Not only are these main body muscles the most important to health in that they surround and support the “engine,” but they are essential to any game or kind of sport. How they are used will be shown in detail in the later chapters which I shall devote specifically to the four major sports. Here I will merely point out that the trunk muscles are essential to the back in football in his dodging, to the batter in baseball in swinging his bat, to the golfer in his drive, to the tennis player in his backhand strokes, to the polo player in almost every move he makes, and so on down the whole list.

It has long been held up to us that the Englishman surpasses us in being an all-round athlete; that he does a great many things and does them with a fair average ability. We in this country specialize too far when we neglect an all-round development to make a man a star in some particular

detail of sport. It may win championships, but, where general exercise is neglected for this one purpose, the future historian will write down that we have been wrong. It makes of sport too much an end in itself, whereas it should be merely a pleasant means to health and fitness. It tends to make a man one-sided.

Some stretching exercises for the muscles of the trunk are essential both for the athlete and the non-athlete, but especially for the athlete, because they keep the main muscles of the body in good condition, tend to give him a greater chest capacity and a better poise and carriage, which mean, after all, greater endurance.

Practically all our sports can be carried on by a man with his head sticking forward and his chest compressed, and, while he is young, youth helps him so that he does not realize what he is losing. Yet any athlete who, by exercising during the seasons when he is not practising, as well as using these exercises to supplement his practice during the season itself, increases his chest measurement an inch or an inch and a half, will have

a better chance in his particular sport than formerly because his endurance will be greater. Also, he is laying a foundation for good health in the future. So much for general exercise.

Special exercises which are not practice, yet are designed to develop the muscles used in one particular sport, may be practised to any extent. A football lineman can do the "duck walk" and other things which produce a greater suppleness in the loins and greater strength to turn and twist. The shot putter may develop the push of his fingers by opening and closing exercises of the hand. The baseball player can exercise his throwing muscles by rotating his arm, etc. All these are special exercises of great value.

Men suffer unnecessarily because they are unwilling to prepare themselves for their practice, *before* the practice begins. If a man is a baseball player he should give a little time each day during the winter to suppling his arm so that when he goes out to begin his practice he will not suffer lameness. Five minutes a day will help. A man who intends to go out for crew should devote some of his

spare time to developing his chest. The actual work in the boat will not do it. During most of the stroke the chest is contracted and compressed. Yet the man must have a big chest or he cannot stand the strain. With a little work and a kind of exercise which is exhilarating and helpful to general health he can attain surprising results just during the winter, so that when the river opens again he can start in with the advantage of greater capacity in his lungs and more room in the thoracic cavity. The difference in his endurance will become immediately noticeable to him. - Incidentally his general health will improve. He will be free from colds, lessen his chance of infection, keep himself from putting on fat, give himself good posture and carriage, thereby greatly improving his appearance, and most important of all, lay a foundation for his later life.

The fact that we do not do this work as a preparation for the strenuous practice of the intensive part of the season, is responsible for much of the ill effects attributed to our athletics. A boy who goes into football thoroughly soft is likely to get hurt. If he had

taken a few minutes each day out of season to supple himself and prepare his muscles for the strain they were to undergo, he could have prevented this injury. A boy who injures his heart rowing might have avoided this by increasing his chest and giving his heart more room. The same is true of the runner whose heart becomes affected.

The proper approach to practice through exercise can be compared to the merging of the fair green on a golf course into the putting green. The fair green is rough, often sloping; it evens off gradually into the putting green, level and smooth, cut short and perfectly adapted to the skilful care necessary to putting. When we try to make our bodies do the specialized work of practice without approaching it through exercise, it is as if we tried to putt while we were still in the rougher part of the fair green. Yet, if the player would put in these winter exercises the coaches and trainers could let the men on baseball teams throw the first day they come out, and the league teams when they go on their southern trip could begin to play ball immediately.

The main purpose of this chapter is to show the relation of exercise to the game itself; how it helps that game, and, most important of all, how the combination of the two makes for health in after life. If sports are not going to make us healthier, happier men we might as well abandon them. If they are not going to give men a general all-round development they lose half their value. They will accomplish both these results if athletes will take the little extra trouble to prepare themselves properly. If they do this, then the game will help the man by making him build himself up into fitness for it. Also, the exercise will help the game, no matter what it is. A boy can take these exercises by himself without apparatus or assistance from trainers. The specific exercises for the various kinds of athletic work will be given in detail in later chapters, and a boy should find no difficulty in learning them.

The results of taking these exercises consistently even for a short time have been quite surprising in the increases in measurements they have brought about, especially with boys. In an article I wrote for the *American Boy*

Magazine I gave these exercises, and also made a "health chart" on which the boys who took them were to record certain measurements. The measurements included on the chart were neck, chest (normal, full inspiration, expansion), thigh, shoulders, height and weight. At the end of six weeks nearly all the boys I heard from had made remarkable gains. One boy wrote to the editor of the *American Boy*:

"When I took my physical examination in school, I was five feet, ten inches tall and weighed one hundred and twenty-eight pounds. After one month of steady exercising, I measured five feet, eleven inches tall and weighed one hundred and thirty-two pounds and my chest expansion had increased one and one-half inches. I am putting special exercise on the crouch, curl and grate, as I am going out for running. At present I am in perfect physical condition except that I am slightly round-shouldered."

CHAPTER IX

EFFECT OF DRIVING BOYS TOO YOUNG AND THE EFFECT OF AGE ON CONDITION

THIS is a broad subject but an important one, for on it may depend a boy's entire life, as far as the health of his body is concerned. If he or his trainers make the mistake of forcing him, while he is growing, to do more than his maturity of body allows, an injury to the heart or nerves may result which will cause serious after-effects from which it will be difficult or impossible to recover. If there is no limit, based on a boy's age, to the amount and character of his work his strength will daily be burned up and his future prospects in athletics ruined. On the other hand, properly conducted and controlled competitive sport in schools is an excellent and profitable thing for boys of all ages whether or not they intend continuing an athletic career through college.

There is plenty of stimulus in ordinary school rivalry without increasing it to the extent that the heart is endangered by over-exercising. Until a boy gets his growth, which varies in individuals from 19 to 24, his heart is immature, and must not be subjected to an undue strain. Distance track races are not for the boy with the immature heart, nor is rowing, to the extent it is sometimes practised, although, if care is exercised, rowing can be made a very beneficial form of school sport as the Eton boys have proved. Yet rowing is a sport which must be watched; it must be avoided by boys whose chest measurement is inadequate because the heart has too little room; and if long courses, strenuous and continued competition, and exhaustion of endurance are permitted it will inevitably be harmful to boys whose hearts have not attained their maturity.

Another important reason for not driving boys too violently is that their nerves are affected. The first symptom of this is a constant feeling of being tired, an apparent laziness, a desire to lie down, to avoid physical effort. This is caused by overwork, continued

strain of worry added to the physical strain due to too much competition, and burning the candle at both ends. By this I mean trying to make a boy's energy and reserve strength do two kinds of work at once—growing and over-exercising. It must never be forgotten that a very large part of a boy's strength is used up by his actual physical growth in the creating of flesh and blood, which is in itself a strenuous process and requires a good deal of food and rest. Our object in athletics for boys is to give them something that will help this growth, harden the flesh into muscle, develop breadth as well as height, fill out the chest, give a lung expansion that will enable the engine to get plenty of oxygen and yet not carry it to the point of over-drawing the strength which is necessary to growth. Young boys should be carefully watched about going stale for this reason. We must always remember that the nerves are the energizers of the muscles; if we submit the nervous system to a severe shock or strain, the muscles must work less efficiently.

One of the frequent causes of nerve exhaustion and consequent going stale among

schoolboys is the taking part in too many different kinds of sport. It often happens that in a small school a good athlete feels it his duty to do everything he knows how to help the school teams. Also, he is generally urged by coaches to go out for all sports. The result is, in the spring of the year, he finds himself playing baseball, running in several events on the track, playing on the tennis team and rowing on the crew if there is one. This is too much; it keeps him working all the time, gives him no chance to rest and burns up his strength. Beside this he may injure his heart and exhaust his nerves. The usual result of submitting a boy to a strain like this is that he goes stale and loses some of the more important events and games. It is wrong for a school to put the burden of its athletic accomplishment on one man in this way, and a good coach generally knows better than to permit it no matter how keen the boy himself may be to go to the limit of his endurance. The Association of College Coaches has recently recommended that a rule be made placing a limit on the number of contests a man may enter during the college

year. A rule of this sort in schools would not only be fairer to the boy, but it would be wiser for the school not to rely too much on a single man to win all its honors. If he is counted on to win the majority of points in a track meet, for instance, instead of having more even distribution, then if he injures or exhausts himself in the first event, it means that the others too are lost. A man should not be counted on to win both the mile and the half-mile, although this has been done. It is asking too much of a boy to expect him to run the hundred, the two-twenty, and the quarter-mile in the same meet.

Another thing which should be watched in schoolboy work is one-sidedness of development. This generally comes from too continuous practice of one particular thing during growth. For instance, the pitcher who does nothing but pitch is likely to develop one shoulder more than the other. A runner may neglect his chest development through too much specializing in running. A shot putter who goes in for no other work and takes no equalizing exercises will develop one side of his body, especially one shoulder, arm and

hand, out of proportion to the other. This is especially true during growth, while the bones are hardening.

Until the ends of the bones begin to ossify, which is really the beginning of the end of growth, a boy is entirely different from the mature man in several respects. One of these is his need of sleep and rest, which has been dwelt on at some length in the chapter on that subject. That a boy grows during sleep is true, because during sleep the building-up process does more work than the breaking-down. At all times these two processes are going on side by side. During the day the destructive one exceeds the other, resulting in an accumulation of waste, while at night the destructive process is very much in abeyance and construction has a chance to do its work. Also, during the night, the waste products in the blood are eliminated, giving growth a chance to work.

We have taken up so far the boy's limitations. Yet the boy has a number of important things in his favor. The principal one is suppleness. Then, too, his bones have not hardened. In infancy the bones are so soft and flex-

ible that they are hard to break and can easily be bent. That is one reason why a baby can fall so much without injury. Also, a baby can go through various contortions of the body, such as putting its foot in its mouth, without difficulty. Young children at play can twist and turn into positions of the body which are quite impossible for the older person. A boy from twelve to eighteen retains a great deal of suppleness and this helps him in all his sport. It gives him a springiness which enables him to throw his whole body into a stroke of any kind such as hitting a tennis ball or batting a baseball, and that quality which makes a sort of flexible steel spring out of his body and gives great speed to a stroke which, if it depended on strength alone, would have little power.

Perhaps this is most marked in the golfer. A caddy with no muscular strength, hardly able to swing a club, will make a far better attempt at driving the ball a distance than the middle-aged man who takes up golf for the first time. That is because the caddy simply throws the clubhead into the ball, whereas the mature man makes an effort to

beat it by the use of his muscular strength. The full-grown man has to substitute muscle for the suppleness and spring of the boy's body.

A boy can sit on a horse more easily than a grown man because he has no rigidity, and is able to flex his body naturally with the motion of the horse, and in this way can quickly change his weight and thus keep his balance. Also, when he is first learning his seat, the motion of the horse jars him very much less than it does the older man.

The effect of age on condition is due to a large number of causes. The curve of athletic efficiency goes steadily upward from fifteen to about twenty-four, at which it generally reaches its maximum; it then keeps level for about five years and begins to go down. The reason for its maximum coming at that point is due to the fact that a man at twenty-four has got his growth so that his heart is mature enough to allow him to make violent and continued physical effort; his endurance is at its highest point, and his suppleness has not left him. Of course this cannot be taken as absolutely definite or fixed. Individuals vary widely

in their adolescence. Some boys are men at eighteen with their full growth and complete physical maturity. In tropical countries boys mature at fifteen or sixteen and often marry and have families at those ages. In some men, on the other hand, the body does not attain its complete growth until after twenty-five. These individual differences should be studied carefully and a boy trained accordingly. In a general way the rules given here apply. Occasionally a boy of seventeen or less will be found who can row a four-mile race with impunity, but on the whole work of this kind is not for schoolboys. The long-distance runs are equally bad.

It is also true that a man keeps up his athletic ability in track and rowing beyond thirty. Of course, I mean here competitive work. A crew of men averaging about thirty years recently went to England to represent the Union Boat Club of Boston in a race at Henley. Baseball, tennis and especially golf, can, of course, be carried further. The following scale of ages in the different sports gives an approximate idea of the effect of age on condition in athletics:

| | |
|--|----------------|
| Football | 15 to 25 |
| Tennis | up to 40 |
| Rowing (racing) | 22 to 30 |
| Running | 15 to 25 |
| Lacrosse and Association football | 15 to 25 |
| Wrestling | up to 30 or 35 |
| Baseball | up to 35 |
| Golf—all ages, but in moderation after 50. | |

CHAPTER X

STORING UP ENERGY

IF there was one thing that the old-time trainer was wont to forget it was this: that you cannot draw for energy upon a supply that has been exhausted. It is exactly like overdrawing a bank account. Each individual has a certain amount of stored-up energy, and bountiful Nature has so arranged it that, in the normal life, there is generally a surplus, or reserve fund, which may be drawn upon in case of emergency. If the emergency does not come too often he is equal to it and does not suffer from it. If, however, he is constantly creating artificial emergencies which tax him to the limit of his strength he is obliged to overdraw and suffers accordingly. Nature shows no special courtesies in this regard. A bank will often permit a man to overdraw his account frequently if it is sure of his good faith. Nature will not.

It is seldom, in ordinary life, that a man taxes his energy to the utmost in any single attempt. The athlete, if he were not spurred on by the rivalry, the exhortations of his friends, the feeling that he must do or die, would stop short of making his final and greatest effort, but in modern days the athlete is brought up to know that he must give everything there is in him, and so he does. The question for the trainer then becomes, "What has he got in him?" and this depends entirely on his training. If, several times during the course of his preliminary work, he has been asked to give everything that is in him and has done it, there is naturally not very much left for the final contest. No opportunity has been given him to store up a new supply of power after it has been depleted.

It is far from my intention to depreciate in any way the spirit of rivalry and competition which motivates our American athletes; I am, on the contrary, heartily in favor of it. Competition is one of the fundamental and powerful instincts of youth; without it any real achievement or success in life would be

impossible. A boy who does not naturally feel the spur of this rivalry, combined with the instinct of loyalty to the school that he as an athlete represents, is not a normal boy, and will probably not make a success of his after life. Then, too, his desire and ability to give everything he has to give to that school are elements of the American character, fostered and developed by American sport, which have made it possible to rise to great national emergencies. The success of our part in the World War was directly dependent on this spirit. The natural, easy willingness of the American to give his whole strength with no thought of self, together with his humorous incredulity of the impossible, have the same origin as the spirit of the track runner in the final meet.

My argument in this chapter is simply that the trainer should make it possible for the athlete, when the test comes, to have something to give. There are many ways in which a trainer, by improper methods, may prevent this and completely exhaust a boy's reserve. One of them is by frequent time trials. An-

other is to make a man repeatedly run his distance in competition with other men so that he is constantly pushed. Another is in never giving the men a day off. A football trainer may tire his men so much as to reduce their efficiency by playing them to a standstill in the daily scrimmage. This is particularly dangerous in football because tired men get hurt easily.

One of the most remarkable of nature's provisions for compensation in the human animal is resiliency of spirit, popularly known as "come-back." If you give a man half a chance he will rebound from fatigue, and even after an exhausting physical experience will completely recover in a short time. If, however, you take him before his "come-back" has started to work and put him through another severe test, his resiliency becomes weakened. For example, three hard games of baseball a week, while it may improve a man's skill in some ways, reduces his ability to keep on his toes, his alertness, interest, enthusiasm, speed, in short, all those qualities which go to make up that pre-eminent attribute of the American athlete

which we describe collectively as "pep and ginger."

There are many ways in which the reserve supply can be increased and resiliency aided which will not in any way detract from the athlete's spirit or reduce his skill. For example, in football: a daily short, sharp scrimmage which leaves the men alert and tingling yet with their reserve untouched. This scrimmage should have plenty of snap while it lasts, because men always feel better after sharp than after slow work if it is not carried to the point of exhaustion. In this way a good deal of their stamina is saved up each day for the real games. There should not be hard scrimmage the week before the final game. During the week before this last contest (which, however it may turn out, is generally assumed beforehand to be the most difficult of the season) the work should be light so that the men will accumulate a lot of reserve energy by the end of the week. It should consist of two or three days of sharp but short scrimmage with the rest of the time spent in running through signals, blackboard talks, etc.—work which gives practice in the

details of the game without the fight which is necessary in scrimmage.

In track, the middle distance runner should seldom run on time. The supreme effort for him should be an unusual thing and should come when he can accomplish most by it, as in a meet, as well as at a time when he can best afford it. A runner of the quarter-mile, for instance, constantly watching his time and trying each day to cut down the mark of the day before, is exhausting his reserve and starting on the inevitable road to "staleness." In the running of preliminary heats the day before a track meet, a sprinter should only try to gain a qualifying place; he should not attempt to come out ahead. In this way he is not putting forth his fullest effort when it is not necessary; he is saving himself and not depleting the reserve store which may become vitally necessary to him in the next day's race.

Sleep is one of the best means of accumulating energy. During sleep, or even during the rest that comes from relaxation, the vitality capital is continually drawing interest. There are some men more dependent on sleep

than others and allowances should be made for these idiosyncrasies. Some men, no matter how great the physical effort of the day before, can get up from bed completely restored if they have been able to get enough sleep. Another important help to storing up energy is the rest that comes from an occasional day off from practice, especially if this day is filled with a complete change of scene and surroundings so that the mind as well as the body gets a chance to shift from the all-important subject. The wise trainer who watches his men carefully will know immediately when this is needed for particular men and act accordingly, not hesitating to increase the time of this "vacation" if he thinks it necessary. It is better for a man to lose two or three days of practice than to take any chance of cutting down his reserve, so that when he comes to draw on it in the final contest he will fail because there is none left.

The extreme of fatigue is when the muscles actually stop working. Experiments in the physiological laboratory have proved this by the use of an electrical current in a frog's leg. The current causes a flexing of the mus-

cles of the leg which continues for a certain time; then the muscular reflex slows down and finally stops entirely, showing that the muscle has become incapable of further action. This has been found to be due to an accumulation of acid secreted by the movement of the muscle. After a period of rest the acid disappears and the muscle may again be flexed, although if insufficient time is allowed, the muscle will work less easily and readily and will become incapacitated sooner. In our bodies the work of the electric current is done by the nerves, and the same effect is produced by fatigue; the muscles fail to respond to the stimulus of the nerves. If, in addition to muscle fatigue, we have nervous fatigue (a condition which comes from excessive competitive work) the stimulus is not strong enough to work even a moderately fatigued muscle.

The immediate results of this "overdrawing" in athletic work are obvious; the after-effects, however, are more serious and difficult to cure. They may be heart strain which will permanently weaken the heart or nervous exhaustion which may cause a breakdown with

all its usual far-reaching results. Trainers are coming to realize these things more and more as they watch the results of different kinds of training, and experience is showing them that the laws of Nature cannot be juggled with and that the limitations of physical man are very definite. With this realization is coming better sport in all athletic branches. It is really largely a matter of figuring, just as are the financial accounts of the athletic association. While the figures on the credit side exceed the debits, we can be sure that our progress is safe and normal; when the balance swings the other way we must be on the lookout for disaster. And we must remember that Nature's settlements for bankruptcy are far harsher than those which are carried out according to man-made law!

One may gather some idea of why storing up of energy is so essential from practical facts regarding athletic events. A man may lose five to seven pounds of weight in a four-mile race lasting a little over twenty minutes. I have seen a football team—a Yale team playing against Princeton on an unusually warm day in November—lose from five to

eleven pounds per man. This particular team was built up in the next week for its Harvard game by rest and relaxation and good food until it recovered practically all its weight and a good deal of its exhausted vitality. Many a team or crew has been in good condition in mid-season and then by too severe work exhausted its margin of energy before the big contest—gone stale—and been defeated. A certain amount of surplus weight as well as surplus energy must be kept against the nervous and physical strain of the big contest. A big contest is far different from practice or from a small game. Not only do the players burn up some energy from anxiety in the hours preceding such a game but they are subject to the excitement incident to the cheering and enthusiasm of thousands of spectators, and this keying up inevitably has its effect in still further demands upon the nervous energy. The whole atmosphere is exhaustive of a certain amount of nerve force which must be in reserve at that time to draw upon. Again, it is like the financial caution that provides something against the emergency. Of all the restorers

and builders up of this surplus there is none that equals sound, refreshing sleep. Particularly is this true of the youth who is still growing, and the younger the boy the more is this sleep needed when he is under a season of training. And he can really accumulate strength and energy by this means quite a time in advance of the demand. Coaches should realize this and should also be very careful about worry. We deal specifically with this in another chapter, but it is a great depleter of energy and should be reckoned with in this connection quite as much as any special physical effort. Another reason why the storing up of energy is one of the prime necessities is that there is, as referred to in another chapter of this book, an especial drain upon the nervous system at the time of an important contest. This drain comes not alone from the greater effort made, but from a number of causes incident to the contest but quite outside the actual play. There is at least a period of twenty-four and usually forty-eight hours in which the mind of the player dwells with anxiety over the coming test of skill. He may be confident of vic-

tory, yet the thrill of excitement is there. If he be despondent over the prospect, still more is the strain present. Then, too, the crowd and excitement and the cheering on the day of the game add to this. Now, if the player is "stale" or over-trained, this causes him still more instability and it may be depression. But if he is full of vitality, in good condition, his excitement is only a pleasant fillip to his high spirits. It will then be seen that conservation of energy—fulness of health—is extremely advisable as a factor toward victory.

CHAPTER XI

SPECIALIZED TRAINING FOR FOOTBALL

THERE are certain qualities necessary for a good football player; some of them are born in a man; most of them he acquires by hard work—exercise and practice. The important question which confronts him is how to acquire these qualities with the greatest certainty and in the least time. Naturally the work of practice during the season gives the bulk of this development, but, as in any other athletic work, it can be materially supplemented by certain exercises preliminary to the season and carried on through the early part of the season's training. To do this work intelligently we should discover what are the necessities for football men in general and for each specific player.

The qualities which should be possessed by everyone who goes in for football, whether he

be a back, an end, or a line-man, are agility, suppleness, speed, strength, endurance, quick co-ordination, rapidity of thought, all-round development and toughness. Obviously many of these come from the daily practice, but for the man who is willing to make an extra effort for the sake of his success on the gridiron, there is the opportunity for outside work in exercises specially designed to develop the required qualities in the shortest time. These exercises are valuable to every man on the team whether or not he is a "born football player"; they are indispensable to a man who is deficient in any of the necessities described in this chapter.

Agility and quick co-ordination are cultivated by any of the various methods of dividing men into small groups and giving them commands which they are to execute instantly. The method used in naval stations and aviation fields in which the men were lined up and the command "HANDS" given, meaning the position of attention; "HEAD," at which they were to place the hands behind the head with elbows back; "HIPS," at which they were to shift the hands to the hips

on the command, brought about a rapidity of muscular action, especially if combined with various tricks. Among these tricks was the practice of proceeding in a certain regular order for a time, then suddenly changing the order; the giving of one command by the instructor, while he himself actually executed another; or insisting that the men remain motionless unless the word "ORDER" preceded the command. All these exercises develop the ability to change positions quickly and in response to an immediate necessity, and at the same time train the mind in keeping always alert. They also produce a habit of quick muscular response to the will. Co-ordination and control of the muscles come from exercises where one arm is required to perform one motion while the other performs quite a different one, on the principle of the old trick of patting the head and rubbing the stomach at the same time. It is a great asset in any kind of athletics to be able to control the muscles independently of each other.

Suppleness can be greatly increased by exercises in which the trunk is turned or

twisted, bending at the waist with the hands behind the head and the elbows back, squatting exercises, etc. For speed, that is actual pace in running, the track trainer who usually works with the football men can be relied upon to use the same methods he uses with sprinters, bearing in mind, of course, that with big men this is a slow process. Yet, even the big men can be quickened by stimulating rivalry in running down the field and work of that sort. Endurance,—the ability to play a fast game without being “winded,” to make long runs keeping up the speed to the end, to dodge quickly and successfully even after a long run, to play an uphill game in the last few minutes after hard periods,—these require a stamina which may be largely developed outside of practice. Breathing exercises are valuable because they improve the condition of the heart and lungs and make them better able to endure strain. Exercises which enlarge the chest, such as the “curl,” in which, while inhaling, the head is bent back, the hands curled into the armpits with the elbows well back, then stretched forward exhaling and finally brought down and

back while the body bends forward at the waist, are excellent for endurance because they increase the size of the thoracic cavity and so give the heart more room. The "curl" is described in more detail in the Appendix to this book. In the Appendix also will be found several other exercises for enlarging the chest. In any hard athletic work it is absolutely necessary for the heart and lungs to have plenty of room to function properly.

Strength and toughness in the sense of the ability to stand tumbles comes gradually from the general practice, and if it is borne in mind that men should be advanced slowly (scrimmages too near the beginning of training being productive of more injuries than the results warrant), a team will generally harden up by mid-season. Rapidity of thought is aided by practice in answering to quick commands. This may be supplemented in the case of the quarterback by asking quick replies to questions on what kind of plays to use on the various numbers of downs. All-round development, of course, is largely dependent on the work a man has done through his boyhood and growth, a subject which is treated

at some length in the earlier chapters of this book.

So much for the general proposition. There is not a man on the team that does not need these qualities, but besides these there is the particular kind of skill that each man needs to play his particular position. If he has developed the general qualities, the details will come easily to him whether he be a lineman, a back or an end. These details are a matter of practice and come to a man as the season progresses, if he is properly trained and has properly prepared himself for the work.

The lineman needs solidity with suppleness, strength and endurance, speed in the sense of quick action, tackling and blocking. From tackle to tackle the weight of the team is concentrated. It is the weight of these men that gives them solidity, together with their hardness; but with this solidity they must have poise, ability to shift the weight easily and quickly, good co-ordination, alertness. These help a man in picking holes and breaking through on the offense. They may be developed by the co-ordinating exercises described

above, and by the daily practice in breaking through, charging, etc. The suppling exercises are also excellent for these men, as they help the twisting and turning of the body necessary both in defense and breaking through and enable a man to get into all kinds of awkward positions in scrimmage without getting hurt. Suppleness is one of the greatest defenses against injury for every man on the team. For the lineman the duck-walk is one of the best of the suppling exercises. To do this, the man should squat, bending the knees but keeping the body erect, then, in this crouching position try to walk forward. The result is a sort of waddling motion (hence the name of the exercise) which increases the springiness of the legs, exercises the sense of balance and supples the whole body. This should be practised for four or five minutes a day and should be included in the regular practice.

Special instruction in blocking and tackling is part of the lineman's daily work. For the tackling a dummy of some kind is used in the early part of the season. This consists of a stuffed bag hung from a pulley by a

weighted rope passing through a pulley. Tackling is also practised by the men tackling each other. This should not be done late in the season as plenty of it comes from real scrimmage.

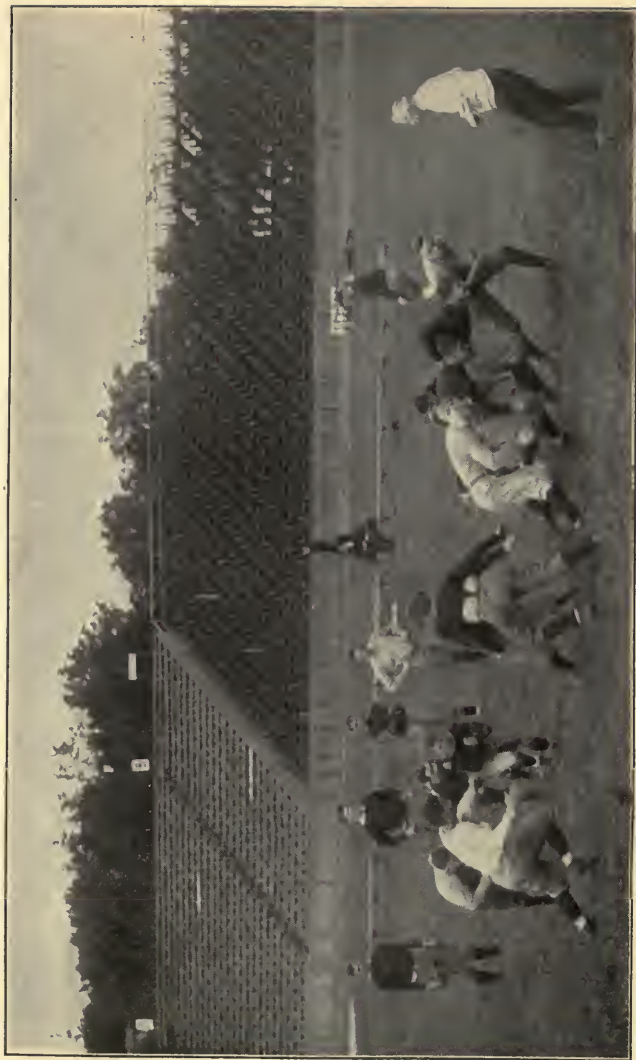
Endurance for the lineman generally means toughness and ability to stand hard knocks. This comes in the scrimmages, the tackling, blocking, charging and falling on the ball.

A back needs quick starting, dodging, kicking, passing, interfering, catching and tackling. The work of starting quickly is largely a matter of quick co-ordination, that and the ability to acquire pace easily may be taught by the track trainer with much the same methods as he uses with his sprinters. Dodging, while co-ordination plays a good part in it, requires, besides, strength and suppleness of the back and trunk, for a good dodger in football changes the actual direction of his feet very little but sways and turns his body, thus deceiving his opponents. When a man first goes out for practice he will find this dodging difficult because the main muscles of his body are not used to it and are stiff instead of supple. Here is a case where a man

can prepare himself for practice by preliminary exercise, thus overcoming the stiffness so that the dodging comes easier to him. This also helps him to avoid the chance of muscle strain.

Three exercises which are particularly valuable for the back in football are the "wave," the "weave" and the "crawl," all described in an appendix. These twist, turn, or bend the upper part of the body without changing the position of the feet and thus supple the dodging muscles. A man who has used these exercises before the practice begins will find that he feels very little lameness in his body muscles after the first day's work on the field.

The kicking is a matter of slow progress, and the great mistake is to have a man kick too hard; trying for distance early in the season before his muscles are in good shape; kicking too long at a time until the muscles get tired, and overdoing generally. The "crouch" exercise will help a man's kicking muscles to get into shape. As to passing, this is similar to the baseball man's problem, and exercises for the shoulders are the very best that can be taken for this work. They



From a photograph copyrighted by "International."

PRACTICE IN INTERFERENCE.

will prevent lame shoulders in nine cases out of ten. The same exercise which is described in the chapter on baseball, holding the arms rigid and horizontal and moving them in such a way that the hands describe circles about twelve inches in diameter, has the effect of suppling the shoulder muscles. Catching is almost entirely a matter of practice, though here again the trunk-bending exercises are of some assistance. Interfering is learned by a dummy made of a stuffed bag like the tackling dummy, of pyramidal shape that will stand up and is about the height of a man. Players run into this with their shoulders. It should be especially emphasized that while interfering they should stay on their feet as much as possible.

The end needs speed, quick starting, dodging, catching, tackling and interfering. He should have extra work in running down the field under kicks, and practice in quick starting from a crouching position, dodging men as he goes down and getting up his pace generally. He should work with the backs in practising passing, interfering and standing dummy work.

CHAPTER XII

SPECIALIZED TRAINING FOR BASEBALL

WHEN a baseball player is incapacitated, the cause nine times out of ten is a lame shoulder. A very large proportion of these "glass arms" are acquired in practice before the season commences, and could easily have been avoided by suitable preliminary exercises. It seems extraordinary that so few baseball men are willing to go through any form of calisthenics to strengthen and put in condition these shoulder muscles, but rely simply upon throwing or pitching to bring them into shape, with the result that thousands of them meet with strains which lessen their efficiency throughout the season, if they do not entirely prevent their playing. The muscles of the shoulder can be made strong as well as supple with very little work, spread over a reasonable amount of time, previous to the actual throwing or pitching, and if this is done and

then a man begins easily and comes gradually up to the hard work, nine times out of ten he will escape without any danger of arm trouble. The best motions are those wherein the arm is held rigid and the hand makes a circle, thus rotating the shoulder and gradually getting all these muscles strengthened and suppld. They should be practised daily throughout the winter, but if begun in the early spring can be performed several times a day. In baseball, as well as in football, men get sometimes what is known as a "charley-horse," which is a strain of the muscles of the thigh, and this also can easily be prevented by exercise previous to plunging into the regular work. Of course if this comes from a bruise or blow it cannot be prevented. The best exercise for this is what is known as the "crouch"; that is, standing with the feet about eighteen inches apart and arms extended horizontally, rising on the toes and then bending the knees, going down as far as possible and up again, keeping the back straight.

It is particularly important in batting, as in all games where a ball is struck with a club

or a racquet, that there be a turn at the waist and hips. This is what puts power into the stroke, but when performed by the arms is slight. The same kind of work that the football man does to acquire suppleness applies here, namely, torsion motions of the trunk. Instantaneous photographs of the long hitters show that the batsman turns his body almost squarely around at the hips in going through and delivering the full force of the blow. A man who bats with his arms only will never make a long hitter. And the man who is stiff and rigid seldom gets great distance unless he meets a speedy pitcher and happens to get the ball at just the particular moment for the greatest effect. A track trainer should work with the baseball men to increase their actual running speed and aid them in the direction of quick starting as well. Of course the position from which the baseball player starts is not that of the sprinter. Particularly not when he leaves the plate after making his hit. When he is on base he has to lead off and consequently get in a sprinter's position, but he can be improved very much in his straight running

speed, and that may make a world of difference in his ability to score.

THE PITCHER

The pitcher is the most highly specialized player in baseball. Batting and base-running powers which might be normally great are sacrificed to a large extent for the sake of higher efficiency in the pitching department. He is always under a greater strain than any other player. For the development of his curves, speed, control and accurate throwing to bases no amount of practice can be too great. If he is to last, the most economic use of his arm is required, and he must rely even more than the long-distance hitter upon the wise comprehension and utilization of body dynamics and the proper, gradual preliminary training of the muscles involved. To get his body into the pitch is the reason of the "windup," which in delivering the ball whirls it off the hand with every advantage taken of the body's centrifugal force and involving the minimum of strain on the arm. The "grasp," the "weave," the "crawl" and "wave" are most effective exercises for de-

veloping elasticity in the body muscles the pitcher will be called upon to use.

In training for a position that involves such high specialization as pitching, the point where the general must be sacrificed for the special varies with the individual. In pitching, an excessive strain is put upon one side. It is thrown out of co-ordination. The drop and out curve especially put the muscles of wrist, hand and forearm under strain and render impossible, at least for the moment, the different co-ordination and the easy natural grip essential to batting success. For the same reason a pitcher ought not, except in great emergencies, force himself on the bases. Games have been lost in the inning after the pitcher stretched a single into a double. The fixed poise of the pitcher in the box, his mental preoccupation, are incompatible with the free and easy starting which may be taught the other players. A pitcher is called on for speed to the limit of his powers in fielding his position or in covering first when the first baseman fields a grounder. In throwing to first to catch a runner napping there is more strain on the arm than in de-

livery and a very different strain on the foot and leg. So with so many strains on him it seems unwise to give the pitcher too much batting or base-running practice. Too great improvement in these departments will result in a slump in his pitching efficiency. Those exercises which tend to develop beyond the general elastic needs of the body muscles not needed in his specialty or inharmonious with it should be minimized.

Good pitching is an asset equally valuable with hitting, base-running or fielding. Slow and even development of his powers, by careful preliminary exercise alone, will give the pitcher ease and confidence in that battle of morale which goes on between batter and pitcher from the moment time is called. By that he acquires a psychological reserve to draw upon when he opposes the absolutely certain coolness and confidence of the superior batter who expects to start a batting rally inspiring his hitherto helpless mates.

THE CATCHER

The catcher in the demands made upon him is almost as highly specialized as the pitcher.

He is the one whom all the players face—the keystone of the fielding game. Confidence and courage radiate from him when cheery and sure to the far corners of the outfield. Nothing so bolsters up a team as the sense of the absolute dependability of the man behind the bat, and the sanguine psychology of a catcher has stimulated many a weakening boxman to pull a game out of the fire.

The catcher's throws to second, while few in number, are long and hard. The pitcher gets his exercise in the game proper. The catcher and other players must have a corresponding amount in practice if power and accuracy are to be in the throwing arm. The catcher's throw to second is not a full, natural throw as when unhurried, but as quick and hard as possible with all the power of body and will behind it. One of the prettiest and uncanniest plays in baseball is the side whip throw of the catcher to nail a runner napping off first—a throw that begins ostensibly as though he were returning the ball to the pitcher. Seldom as it may be called into use, the effective threat must be in the catcher's

arm, and it can only be there through the perfect co-ordination of the muscles called into play.

Everywhere baseball calls for speed and more speed, and in no position more than when the catcher throws his mask and turns for a foul. He must doff his mask, turn, start and look virtually simultaneously, and that from a stance that tends to be rigid for quick starting.

These are the important special functions of the catcher, and he will be compelled to concentrate on exercises that will strengthen and develop them if he is going to give the sense to fellow players of being an impregnable tower of strength at home-plate.

FIRST BASEMAN

The natural qualifications of the superior first baseman are height, reach and suppleness that enable him to sway far to either side for wide balls or to reach far forward for the short pick up or backward to take the low thrown ball on the long bounce—to stop any reasonable or unreasonable throw within reach and keep his foot anchored to the bag

however awkward the position. With the catcher and third baseman he must be able to pick a high foul off the fence, and ability to throw strongly across the diamond is occasionally a winning asset.

SECOND BASEMAN

With both the first and second baseman, if their skill in other respects is high, extraordinary power in throwing is not indispensable. Most of the latter's throws, except from double plays, are short, and many second basemen jerk the ball to first underhand. But whether under or overhand, it is a quick, whippy throw, performed largely with the arm. In fielding the deep, slow grounder, near the bag, and in completing the double play to first, accuracy and speed are the great considerations.

SHORT STOP

The short stop plays a slightly deeper field than the second baseman, and as the distance to first is considerably longer, a more powerful throw is needed. He is also called upon to cover second on double plays

or to receive the catcher's throw. Between catcher, second baseman and short stop, takes place most of the fine team work which gives baseball its undying charm. These players must work together with the precision of a well-oiled machine, and on both sides of the second bag tireless practice together is imperative if this result is to be attained, and it must be attained if smooth and fast double plays are to be expected.

THIRD BASEMAN

The prime requisite of the third baseman is a speedy, long and powerful throw to first. The third baseman is called upon to field harder hit balls than the other fielders and that at a shorter distance from the batter. The majority of bunts also are laid down along his foul line. He must, therefore, be practised in quick starting for fielding bunts, and especially in picking up the ball at full speed and throwing in almost the same motion. He should have the location of first so well in his mind that he might almost throw with his eyes closed.

THE OUTFIELD

If fielding qualities can be sacrificed to secure batting power anywhere it is in the outfield, but whether or not an outfielder can cover a great deal of ground, he must be sure on ground balls and have a powerful throw. The long, low throw of the outfielder to catch a runner at the plate is justly one of the most popular plays in the game, and the nipping of a runner at the plate has meant the winning of many a close contest. It calls on the player for more energy of the whole body than any other throw.

In general, baseball may call upon any player for a display of acrobatic ability of a high order. At any moment he may be required to perform the unbelievable. All players must develop their powers of reaching with one or both hands, to get off the ground as far as possible after a high ball, to start quickly, to turn and start as quickly, to catch a ball from the grass-tops running and reaching far forward or to take a fly while running with the ball and looking over



Courtesy of S. P. Edgerton.

SLIDING TO THIRD—PREP-SCHOOL GAME.



SLIDING TO THIRD—COLLEGE GAME.

the shoulder. So entirely elastic must the body be for all the varied strains it must undergo that any exercise that tends to muscle binding or to rigidity in any degree should be strictly tabu.

CHAPTER XIII

SPECIALIZED TRAINING FOR TRACK ATHLETICS

IN a book published a few years ago in England by one of the most competent trainers of that country, the author speaks of power, suppleness and poise as the outstanding characteristics of the track athlete. It is interesting to see that the recognition of suppleness as an essential is not a new idea. Under these general classifications may be included the more concrete details of stride, balance of the body, use of arms and shoulders, use of the main muscles of the body, proper development of the leg muscles, endurance, and condition of the heart and lungs. These are things nearly every track man must have more or less as a foundation for his particular work in whatever event he goes in for.

In the matter of stride, there is, of course, a difference in individuals; some men have

naturally a short stride, others a long one, depending on the length of their legs. Either of these, however, may be increased to advantage, and this is often done by an efficient use of arms and shoulders to help the driving power. It is surprising how much improvement a man will show by a slight lengthening of his stride, by using his arms and shoulders to drive himself forward instead of swaying from side to side, and finally by getting that peculiar poise of the body which keeps him well over the driving power so that he makes every effort count.

The use of the main muscles of the body, that is, the trunk and back muscles, is necessary in most track events and these may be developed by the exercises described in previous chapters and also in the Appendix. The "crawl," "wave," and "weave" are the most important of these; the "grasp" and "curl" are also good. Care should be taken with both sprinters and distance runners that there should be no over-development of the leg muscles. It is curious that cramps seem to come more frequently to men of big muscles than to those less developed, and over-de-

velopment of muscle never prevents a strained ligament. Springiness is what is needed most; not mere muscular strength. Endurance is most necessary for the distance men, though every track man needs it to some extent.

For the distance runner lightness is an advantage, poise and the ability to carry the body well and make the right use of the arms and shoulders in driving forward rather than in swaying are of great importance. Endurance, however, is the prime factor and more effort should be spent in attaining this than in anything else. A distance runner should work on this during the winter by constantly trying to improve the condition of the heart and lungs and to increase the size of the chest, for on these things endurance depends. Breathing exercises, like the "curl" (see Appendix), outdoor jogging, work that opens up the chest and gives the heart a chance, all these count radically in favor of this type of runner. This winter work should be watched, however, so that no over-development of muscle results from it. One of the effects of distance running is the

long-continued strain on the muscles of the calf and the ball of the foot, and men that are over-trained are likely to suffer from muscle strain.

The Marathon runs, because of the great physical effort involved, are of doubtful value as sport. Of course, at the time of their origin in ancient Greece they had a real purpose: to develop runners for carrying messages. Nowadays, however, no one would ever be called on for any physical exertion for which Marathon running could be preparation.

The Marathon race is a test of grim determination, will power and perseverance. It requires years of slow and careful training to build up sufficient endurance and power to finish. It is extremely foolish for young boys to try to compete in such events; no one, in fact, should go in for Marathon running in competition until he has got his full growth.

For the sprinter, of course, endurance is less necessary than for the distance runner. Sprinters do not drop out in a hundred-yard dash, yet there is a large proportion of them

that fail to finish the hundred at the same speed in which they are running at, say, fifty yards, so there is a certain amount of endurance to be developed even in the sprinter. But the sprinter's great needs are strength, power, springiness, co-ordination, and, of course, most important of all, speed, especially at the start. The hundred-yard dash is so short and so quickly run that every fraction of a second must be made to count and the start must be perfectly mastered. The spring, the perfect timing and the quickness of getting into the stride must be practised through the early part of the season until they are thoroughly learned in every detail.

The start was formerly made from the standing position and was continued so in England long after we, in this country, had adopted the crouching start. The English have finally been forced to come to the new method, though they did it with reluctance. Now, however, there can be no doubt in anyone's mind that with the crouching start there is a tremendous initial advantage. In the first place, if it is done properly the body is so perfectly poised that at the pistol there is



From a photograph by Underwood and Underwood.

START OF A 100-YARD DASH.



From a photograph copyrighted by Underwood and Underwood.

FINISH OF A 100-YARD DASH.

no lost motion. Secondly, the body is, so to speak, "wound up," in the sense that a spring is wound, so that the recovery into the running position is a perfectly normal and spontaneous reaction. Finally, in the crouching position there is less air resistance, which makes it easier to overcome the natural inertia in starting. The difference between the crouching and the standing start is the difference between diving and falling flat into the water.

In order to carry out the purposes of the start it is necessary to have great suppleness and perfect co-ordination. The suppleness makes it easy for the runner to get out of the crouching position quickly. An excellent exercise to develop this suppleness is the "crouch" described in this book. Co-ordination is necessary because the body must be so perfectly poised that it will neither jump the pistol nor be behind it; on the instantaneous response of the muscles to the mental commands depends the success of the start more than on any other element. Jumping the pistol is the commonest fault of beginners; it comes always from lack of co-ordina-

tion. The mind is so set on not being behind that it forgets the pistol. Here is where the balance comes in. The mind must be equally poised between two things: the spring of the start and the crack of the pistol, so that when one of them occurs the other will be simultaneous with it. If the runner thinks so hard of his start that he forgets the pistol he will start before the pistol is fired, while if he concentrates on the pistol to the exclusion of the start he will have to hesitate after the crack long enough to get his mind back. This hesitation, while it lasts but a small part of a second, may be sufficient to lose the race.

Co-ordination may be learned by any of the exercises before described for this purpose, but in the case of the start for the sprint it can only be perfected by continual practice. In the early part of the season the sprinter should devote a large part of each day's work to trying starts, and he should not stop working at it until he is sure he has mastered the co-ordination. In starting practice the sprinter should not run more than from 15 to 20 yards and should not stop suddenly. After the start has been perfected, the runner

may learn to get into his stride which comes by practice and learning individual differences in regard to stride, and finally the finish of the race, which is perfected after the runner has gained strength from the daily jogging. It is in this last burst of speed that strength counts more than anything else. Muscles that are not sufficiently strong will sometimes "tie-up" during this part of the race and incapacitate the sprinter.

For the 220, a man needs these qualities plus endurance. Presumably he runs his hardest all the way in the 220. Of course, he does not really run as fast as he runs the hundred though it seems as fast to him. In this race the final burst counts a little more than the start. The quarter-mile is perhaps the hardest race there is; it is practically a long sprint. The quarter-miler requires many of the qualities of the sprinter, although here endurance counts heavily and the sprint at the end is more necessary to develop than a perfect start. The conservation of strength required for the final spurt of this race is something which comes from much training, and the use of all the exercises which develop

the chest and aid the functioning of the heart and lungs.

The hurdler, combining, as he must, the abilities of sprinter and high jumper, requires a good deal of work. Keeping his stride is the most important thing for him to learn, and this comes only after continued practice. It is useless to try to lay down either the precise point at which the take-off for each hurdle should be made, but the number of strides which should be taken between hurdles has become practically fixed for any man who can approach the present records. In general, a long stride is necessary for the hurdles, and for this reason the best hurdlers are generally men with long legs, though this is not an invariable rule. Simpson and Thompson, the two great hurdlers, are long-striding, powerful men.

The hurdler must guard against unevenness of running between hurdles, he must cultivate the best form in taking the hurdles, and he must be careful not to overwork. This last is important because the continual hard pounding on the cinder track required in this race causes the kind of muscle strain described

in the chapter on injuries, the symptoms of which are pain along the shin bones and between the bones of the foot. The hurdler has not the same soft, dug-up ground to come down on as the high jumper, and for this reason he should practise on the grass whenever this is possible and work up gradually, beginning with one or two hurdles and increasing the number.

The hurdler shares with the high-jumper the necessity of developing the trunk muscles. It is with these muscles that they both keep their balance. The high jumper needs it especially for his turn in the air. Other needs of the high-jumper are great springiness and suppleness of the body. He must have great patience and perseverance, and faith in his own ability. The best build for the high jumper is tall and long-legged, though, as in everything else, there have been notable exceptions. The take-off is important for the high jumper, also the form, and these are developed through practice. In schools where the coaching is not of the best, boys often learn improper form in the high-jump. Bad form always comes easier to a beginner, but

it is useless for any real accomplishment and is hard to get rid of, once it is learned.

Leg muscles developed by the "crouch" exercise give spring to the high-jumper. This exercise is also helpful in the running broad jump; so also are the "grasp" and "wing." The abdominal and stomach muscles are essential in the broad-jump; much of the force which is given to the body in the spring of the jump comes from them and they are used entirely in the recovery after the jump is made, to keep the balance. Broad-jumping is mostly a matter of running speed and spring and the practice of keeping everlastingly at it, with great perseverance and with that optimism which is spoken of at the end of this chapter. Poise is essential and strength is important. A special build is less necessary than in the case of the high-jumper and the hurdler.

The pole-vault, while it is one of the most beautiful and spectacular of all athletic events, is, perhaps, the most difficult of all and requires a vast amount of patience through long periods of discouragement. The pole-vaulter combines the qualities of the jumper with those of the gymnast. He needs

suppleness, strength of arms and hands and strong trunk muscles. The spectacular part of the pole-vault is due to the fact that the vaulter is able to throw himself over a bar which is twice as high as he is, and to do this the main muscles of the body must be brought actively into play.

Form is essential in pole-vaulting, down to the smallest details, such as sliding up the left hand on the pole to a position just below the right hand as the pole is slid into the hole; not jumping in leaving the ground, etc. To get the details of form perfect, they should all be practised for a long time at first without trying to clear a bar. The pull and the turn of the body cannot be learned without a good deal of preliminary gymnastic work, as the turn really consists of putting the body in the position of what is known in gymnastics as the "hand-stand."

For the hammer-throw the principal muscles used are those of the back, trunk, legs and shoulders. Hammer work needs a man of large powerful build, especially in the upper part of the body, and is an event which requires strength rather than endur-

ance. All the stomach, chest and shoulder exercises are good preliminary training for the hammer-thrower. The shot-put requires much the same qualities, weight and muscular strength, especially in the back and shoulders. Besides these it needs strength of fingers, as the shot should rest well back on the fingers before it is put, and it requires good finger muscles to give it the proper support. These can be developed by exercises of opening and closing the fingers.

There are one or two details about the anatomy of track athletics which are well to remember. The leg is a long lever which drives the man ahead by pressure on the groin, and the strain of leg-work comes on the stomach, loins and groin. The drive comes from the front of the thighs, loin muscles and muscles of the buttocks and back of the leg. The arm swing taxes the upper part of the body and the triceps. The nerves are the governors of all the muscles, acting on them much as an electric current. The nerves are connected with different parts of the brain in which each of the impulses causing the action of any muscle originates.

Because of this nervous connection, thought action is important in training, and much of the success of the best track men has come from right thought about their work. There is an optimism which is essential to any athletic work which requires as much patience as the track and field events. Take, for example, the high-jumper. If the bar is placed at 6' 3" when he first goes out to jump, it will be impossible for him. This is partly because he has not sufficient confidence. If, however, it is placed at 5' 3" and he jumps it easily, he will be quite sure of himself at 5' 4" and so on, constantly working up bit by bit, each time feeling confidence in himself to do a little better next time.

Another phase of mental attitude which is important in any competition in which endurance plays a part is the realization of your opponent's condition. This was one of the things which won the war for the Allies. Marshal Foch, Commander-in-chief of the Allied armies, when he got news of the fatigue and exhaustion of the men, constantly dwelt on the fact that conditions must be even worse with the Germans. In one of the most

difficult times of the war after the big German drive of March 21, 1918, Foch said to Lloyd George: "Frankly, if I had to choose, I would rather be in my place than in that of the Germans."

This is one of the most effective kinds of optimism; the confidence that, while you seem to be at the end of your rope, the man who is competing with you is probably just as near the end of his. It gives new courage and strength and takes away the dead feeling of hopelessness which comes from the apparent certainty of defeat.

Track is one of the best of all athletic sports, both in its development of the men who take part in it and in the spectacular and beautiful nature of the events. There is probably nothing in which grace of body, beauty of motion, the smooth even working of powerful muscles are shown to such advantage as in a track meet. There is probably nothing which develops such poise and suppleness. Besides these, it has in it the fascinating element of individual competition, and the excitement of the race.

CHAPTER XIV

SPECIALIZED TRAINING FOR ROWING

It would probably surprise a good many people to know that, as a matter of fact, rowing does little to enlarge the chest or expand the lungs. Of course the winter work, the running, and that sort of thing helps the men in this way, but, while actually rowing in the boat, the chest is contracted a good deal of the time, and while the muscles of the back and stomach are very considerably developed, the chest stays about the same. It is often true that a man's chest measurement does not increase at all from the time he first sits in the boat until, four or five months later, he rows his race.

Yet it is extremely important that a man who goes in for rowing should have a large chest. The heart increases in size during the season's work and it cannot do its work

properly in a crowded space. The lungs too must have room or they will not be able to take in the necessary amount of oxygen to sustain a man through his race. For this reason care is always taken to select men who have naturally, or have acquired through some other sort of work, a good chest development. It is criminal to allow a man to row in competition who has not a sufficiently expanded chest. Thirty-seven inches should be the minimum for a six-foot man who is expected to row a four-mile race.

Of course this cuts out a good many men who may be otherwise well adapted to crew work, who like it and who have, perhaps, set their heart on it. For these men I should advise steady, careful work at exercises which are calculated to develop the chest and expand the lungs. It is amazing the results that can be obtained by regular daily calisthenic work if a man concentrates on the proper exercises. These are the breathing exercises, of which there is a large variety ("the curl" shown in the back of the book is one of the best of these); the chest stretching exercises such as the "grate," the "grind" and the

“wing.” If practised through the winter these exercises will often bring a man’s chest up to the requirements by the time the rowing starts in the spring. Even for the man whose chest is naturally good these exercises if taken through the winter will be valuable supplementary work.

Beside the chest, there are other qualities the oarsman must possess to be successful. He must have a powerful back, good thighs for his leg drive, and he must not be stiff. A stiff man in a boat is usually a drag instead of an aid. Suppleness, so necessary in all the other sports, is important here also. The bending exercises, stretching and torsion exercises for the muscles of the trunk are excellent for the rowing man. Examples of these are the “crawl,” “wave,” “weave,” “grasp,” “wing” and “curl.” Then he may also develop the thighs by means of the “crouch” and other exercises of a like nature. It is well to give some attention to the power of the forearm in order to increase the grip and the ability to handle the oar easily. The compression exercises, done with an elastic ball or other material which resists the grasp of the

hand, are useful for the grip. Taking a sheet of newspaper at one corner and, using one hand only, gathering into a ball in the hand and squeezing it into as small a space as possible, has been used to some extent in this work. Of course the work on the machines will help the grip considerably. The biceps is immaterial and will generally take care of itself; that is, it is not necessary for an oarsman to have particularly powerful biceps, for the average man has enough strength there to finish out his stroke, and the greatest amount of power is applied with the arms acting as steel rods and the back and legs doing the work. The triceps—that is, the muscle at the back of the arm—comes in on the shooting with the hands out on the recover, but speed here is more valuable than strength.

It is worth while to repeat here what I said in a previous chapter about young boys rowing. A moderate amount of rowing, if it is carefully supervised, will do no boy harm, but such strenuous work as is required by frequent races, time trials and long-distance work is bad for the immature heart. Four-



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WORK IN ROWING TANK.



From a photograph by "International."

CREW ON THE WATER.

mile races such as are rowed by college crews are not for boys who have not got their growth, as the consequences to the heart are likely to be serious.

Training for rowing requires a great deal of hard work, both in the spring and fall on the water with winter training to build the men up and keep them fit and work in the machines. The methods in use at the present day are the results of an evolution of more than fifty years. It is interesting not only to the oarsman, but to every athlete, to go back over this ground and follow the development. The work in the other more strenuous sports, such as football, has gone through a somewhat similar process in matters of diet, etc. The following brief résumé gives an idea of this progress:

TRAINING IN EARLY DAYS OF ROWING

1858—The work of the Harvard crew this year consisted in walking, running, gymnasium work, tossing 12 lb. cannon ball, etc. Their diet was severe, no vegetables but rice being allowed, no fish, only beef, mutton, stale bread, oatmeal gruel, and small quan-

tities of milk and water. The most trying part of the training was the endurance of thirst.

1864—Despite the discouraging outlook at the beginning of the year the best material at Yale was picked out and a green crew was kept at work and inspired the energy of Bacon. The training they went through was tremendous. It lasted in its severity about two months before the race. They rose at six, walked and ran before breakfast, on an absolutely empty stomach, between three and five miles—running more than one-half of the distance and part of that at full speed—and often carried small weights in their hands. They rowed four miles at full speed both in the morning and in the afternoon. Their bill-of-fare consisted of beef and mutton, with occasional chicken, toasted bread, boiled rice and weak tea. No wine or beer and but few vegetables.

1866—The defeats of the two previous years caused the Harvard men to set to work in earnest this year. Beginning early in the fall, they ran every other day five or six miles at half speed. Their system of diet be-

came more liberal, the motto now being "Keep all the flesh you can and do the prescribed work," instead of as formerly, "Train off all the flesh you can." This diet was kept up to the day of the race, the result being a well-trained crew in much fuller flesh than usual, but with no over-trained men in the boat. New weights were used, gymnastic exercise and outdoor walking and running practised until in the spring they could row on the river.

1872—The defeat of Harvard, which so stimulated the smaller colleges, appears to have taken away a large amount of interest in boating at Harvard itself, so that great difficulty was experienced in getting a crew together. An entirely new set of men were chosen, the old oars refusing to row. Despite the fact that this crew was given a more liberal diet than usual, with fruits and vegetables in moderation and with occasional ale, they came to the line somewhat over-trained.

1881—In the last half mile both crews put up the stroke, Yale doing 44 to Harvard's 40, and finishing a length and a half ahead. It

was one of the hardest-fought races ever rowed in America, in spite of which both crews came in without any "done-up" men, which testified to faithful and skilful training.

1887—The diet of the crew may be given as being fairly representative of the latest ideas in regard to this branch of the training. For breakfast and supper the crew ate oatmeal, beefsteak, mutton chops, eggs, stewed or baked potatoes. For dinner, roast beef, mutton, fricasseed chicken, potatoes, rice, macaroni, tomatoes, puddings, and watercresses in season. The work of the crew occupied, on an average, three hours every afternoon, besides which the men worked all the spring in pair-oars during the mornings, as their recitations would permit.

It must be remembered in the case of the oarsman that he cannot be trained down to the point of extreme leanness except at great risk. This is peculiarly so for a double reason. In the first place an oarsman loses several pounds in a hard race, especially a four-mile one, and, if he has nothing to spare in

the way of flesh, his endurance gives out. The second reason is that rowing, unlike football, is practised during a period of the year when the weather is becoming warmer and may be for the last month quite hot. This tends to take weight off men, while in football the weather is all on the side of the player as it is becoming constantly cooler and more bracing as the season goes on.

A reasonable surplus of weight should therefore always be kept in the case of the oarsman. As to his nervous energy, rowing is unlike many of the other sports in one respect, and that is there is no direct contact between the competitors. There is no physical meeting as there is in football. To many men the high tension of nervousness that prevails in a football team at the moment of the first kick-off is relieved almost immediately when the first scrimmage comes. The rowing man has no such physical contact with his competitors to act as a safety valve, although after his first few strokes, and when the crew settles down to steady rowing, he too feels something of this relief. A really phlegmatic man in a boat has little nervous strain, it being largely physical,

but the high-strung oarsman is oftentimes making a steady strain on his nervous energy. He is keyed almost to the cracking point as he waits for the referee's word. Then, if the race be close, he senses that other boat stealing along by his side and almost feels each beat of their blades. So men differ as to the kind of preparation. The high-strung man must be always watched during training and relaxation furnished him at times during the season. Especially is this true of a stroke oar, for upon his stamina and nervous condition much depends. He must have that store of vitality that enables him to drive his crew. If he becomes lackadaisical the crew slumps. If he is keen and confident the crew responds. The Harvard-Yale race of 1920 demonstrated how much depended upon perfect condition and reserve power, for here a crew that had been the favorites were beaten and actually rowed down by a crew that had not been so strongly fancied but who betrayed from start to finish a fund of vitality upon which they could draw when needed. Another illustration of the necessary preparation for a young man stands out most prominently in what is generally accepted as the

explanation for the success of English coached crews over there and the failure of some of the English coaches who have been over here to perform the same work with a crew of American boys. In fact, those English coaches who have been successful with American crews have usually modified somewhat the body swing after experience with an American crew. The explanation referred to above lies in the statement that the British universities get their men from the rowing schools like Eton, and these boys have been brought up on the pronounced body swing of English rowing from their early schooldays. Hence, the muscles of the body, particularly those of the abdomen, are better developed to stand this strain. Now, if this be true, then it would be quite possible by other exercises of a special nature to prepare a crew in a year or two to stand this work. In fact, it is well known that very little attempt has been made to directly develop by special exercises the young man of this country. Instead of making use of these we select our rowing men from the group that is most likely to have such qualities, and then do nothing with them to further develop

the special muscles needed. That probably explains why we have occasional men giving out in a race and other men showing effects that preclude their continuing in the boat.

APPENDIX

The exercises which I am here appending have been referred to a number of times in the course of this book and have been advocated as profitable adjuncts to training for all of the sports. The Daily Dozen were originally designed as a method of good, rapid, all-round conditioning of naval recruits for the hard work ahead of them. They were used instead of the Swedish and other methods which had formerly been tried out because they were less fatiguing and tended to develop the main muscles of the body instead of concentrating on the arms and legs. I am giving them here in the form in which they were given at the naval training stations during the war. This form presupposes the presence of a leader whose movements are followed by a class. Such classes have been organized in schools and colleges and have proved very useful, but the exercises can easily be done individually in one's bedroom or other convenient place by simply following the directions, assisted by the cuts.

THE DAILY DOZEN SET-UP

The Daily Dozen Set-Up consists of twelve exercises which, for ease in memorizing, are divided into four groups of three exercises each. Each exercise

or movement is given a name, and the names of all the movements of a group commence with the same letter, thus:

| I | II | III | IV |
|----------|----------|-----------|----------|
| 1. HANDS | 1. GRIND | 1. CRAWL | 1. WAVE |
| 2. HIPS | 2. GRATE | 2. CURL | 2. WEAVE |
| 3. HEAD | 3. GRASP | 3. CROUCH | 3. WING |

These exercises are not difficult or exhausting, and do not demand great strength for proper execution, but they are designed, both from a scientific and a practical point of view, to give exactly the right amount of exercise to every muscle of the body. They are intended to promote suppleness and especially to strengthen those muscles which are seldom brought into play in ordinary daily life. A conscientious fifteen minutes a day with the DAILY DOZEN SET-UP will soon do more for a man than any amount of skilful physical feats or "strong-man stunts." When one first practises these movements, their effect will be felt on the little-used muscles of the neck, back, and stomach; yet they will not leave the pronounced muscular fatigue which follows the ordinary exercises, and which is of more harm than good.

Any setting-up exercises should be preparatory; that is, make men ready for the serious work of their day, and in no way exhaust any portion of their vitality. This modern "short-hand" method of setting-up leaves men in an exhilarated condition, and, instead of taking anything out of them, prepares the body for any kind of work that is required.

Each exercise starts from the position of Attention:

1. Heels on the same line, and as near each other as the conformation of the man permits.
2. Feet turned out equally and forming with each other an angle of about 60 degrees.
3. Knees straight without stiffness.
4. Body erect on hips, inclined a little forward; shoulders square and falling equally.
5. Arms and hands hanging naturally, backs of the hands outward; thumbs along the seams of the trousers; elbows near the body.
6. Head erect and straight to the front, chin slightly drawn in without constraint, eyes straight to the front. See Figure 1.

The Leader takes a position facing the men, who should be so placed as to give ample room for unhampered movement.

Each movement should be executed in time with the orders or counting of the Leader which should, with the exception of the Speed Test, which is a catch exercise, be slow and measured. These exercises do not depend upon snap for their effect upon steady, deliberate strain of the muscles. Any tendency toward hurried, careless execution should be immediately discouraged by the Leader who should, at all times, insist upon uniformity of movement.

In the following instruction, the preparatory commands are in capitals, thus: ORDER. The commands of execution are in italics, thus: *Hands*. Explanation of each movement is given in parentheses.

GROUP I

1. HANDS

HANDS: READY: *cross.* (At *cross*, arms are extended laterally and horizontally, palms down. See Figure 2.)

ORDER: *hands.* (At *hands*, the arms are brought back to a position of Attention close to the sides. See Figure 1. *Especially care should be taken to see that whenever, throughout the exercises, this position is taken—as at the completion of each exercise—full control is retained over the arms, and the hands should not be allowed to slap against the sides audibly.*)

ORDER: *rest.* (At *rest*, always return to a position of Attention. In this case there would be no change.)

2. HIPS

HIPS: READY: *cross.*

ORDER: *hips.* (At *hips*, the hands are placed on the hips with shoulders, elbows, and thumbs well back. See Figure 3.)

ORDER: *rest.*



1. Hands.



2. Cross.



3. Hips.



4. Head.



5. Grind.



6. Grate (upper position).



7. Grasp.



8. Crawl
(upright position).



9. Crawl
(crawl position).



10. Curl
(curl position).



11. Curl (arms forward).



12. Crouch.



13. Wave.



14. Weave
(turn position).



15. Weave
(bend position).



16. Weave (combination
turn and bend).



17. Wing
(stretch position).



18. Wing
(wing position).

DOZEN SET-UP.

3. HEAD

HEAD: READY: *cross.*

ORDER: *head.* (At *head*, the hands are placed behind the neck, index-finger-tips just touching, and elbows forced back. See Figure 4.)

ORDER: *rest.*

The above exercises should be executed but a few times each, being preparatory to the Speed Test.

SPEED TEST

In this, the preparatory command, ORDER, is omitted and the Leader gives the commands, *Head, hips, hands, etc.*, in sharp succession, varying them, and occasionally repeating a command in a manner calculated to catch the unwary napping.

SPEED TEST *

SPEED, TEST, OMITTING THE WORD "ORDER": *hands, hips, head, etc.*

ORDER: *rest.*

The length of time devoted to this movement is left to the discretion of the Leader.

GROUP II

1. GRIND

GRIND: READY: *cross.*

PALMS: *turn.* (At *turn*, the palms are turned up with backs of

* This should be performed with snap and speed.

hands down and arms forced back as far as possible. See Figure 5.)

ORDER: *grind.*

one

two

three

four

five

to

ten.

—

(At *grind*, and in time with the Leader's measured counting, circles of twelve inches diameter are described with the fingertips which move forward and downward, then backward and upward, the arms remaining stiff, and pivoting from the shoulders. On the backward movement of the circle, the arms should be forced back to the limit. A complete circle should be described at each count.)

Reverse.

one

to

ten

(At *reverse*, the same process should be gone through, the circle being described in the opposite direction.)

• **ORDER:** *rest.*

Ten circles are described in each direction.

2. GRATE

GRATE: **READY:** *cross.*

ORDER: *grate.*

one

(At *grate*, and as the Leader counts *one*, the arms are

two.
— slowly raised, as a deep inhalation is taken, to an angle of 45 degrees from horizontal, and at the same time the heels are raised till the weight of the body rests on the balls of the feet. See Figure 6. At *two*, the arms are returned to *cross*, as all air is exhaled, and the heels are lowered to a normal position. Care should be taken to see that the arms are not allowed to drop below the level of the shoulders or rise more than 45 degrees.)

ORDER: *rest.*

The arms should be raised and lowered ten times.

3. GRASP

GRASP: READY: *cross.*

| | |
|----------------------|---|
| ORDER: <i>grasp.</i> | (At <i>grasp</i> , the position <i>head</i> , |
| <i>one</i> | is taken. See Figure 4. |
| <i>two</i> | With head up and eyes |
| <i>three</i> | front, and in time with |
| <i>four</i> | the Leader's counting, |
| — | <i>one, two, three, four</i> , the |
| <i>one</i> | body is bent forward from |

two
three
four
 —

one
two
 —

the waist, as far as possible. See Figure 7. The body is returned to upright in the same number of counts and at an unusually slow *one* is bent as far back as possible from the waist, being returned to upright at *two*. Care should be taken to see that this motion is sustained and not jerky.)

ORDER: *rest*.

The entire movement should be repeated five times.

GROUP III

1. CRAWL

CRAWL: READY: *cross*.

ORDER: *crawl*.

one
two
three
four
 —
one
two
three
four
 —

(At *crawl*, the left palm is turned up and as the Leader counts *one, two, three, four*, the left arm is raised and the right arm lowered laterally until at *four* the right arm should be in a position of *hands*, and the left arm should be extended straight up with the palm to the right. See Figure 8. Then, as the Leader /

counts *one, two, three*, the body is slowly bent side-wise from the waist, the right hand slipping down the right leg to or beyond the knee and the left arm bending in a half circle over the head until the fingers touch the right ear. See Figure 9. At *four* the position of *cross* is quickly resumed, and as the Leader commences to count again, the RIGHT palm is turned up and the exercise completed in the opposite direction.)

ORDER: *rest*.

The entire movement should be repeated five times.

2. CURL

CURL: READY: *cross*. (In this movement, at *cross*, the feet are spread until the heels are about twelve inches apart. The left foot remains stationary, the right foot being moved to accomplish this.)

ORDER: *curl*. (At *curl*, and as the Leader counts *one, two, three*,

one

two
three
four
 —
one
two
three
four
 —
one
two
three
four
 —

?

four, the fists and lower arms are bent DOWN from the elbows which are kept pressed back, and the fists are curled into the arm pits. This position should be reached at *three*, when the head and SHOULDERS should be forced back very strongly; reaching the limit of motion at *four*. See Figure 10. The Leader again counts *one, two, three, four*. At *one* the arms are extended straight forward from the shoulders, palms down. See Figure 11. At *two* the arms begin to fall and the body bends forward from the waist, head up and eyes front, until, at *four*, the body has reached the limit of motion and the arms have passed the sides and have been forced back and (as the trunk assumes a horizontal position) up as far as possible. See Figure 18. (Note that in this

Figure feet are together, which is incorrect, for this exercise.) This is the *wing* position. For a third time, the Leader counts *one, two, three, four*, as the body is straightened, reaching an upright position with arms straight forward at *three*. *Cross* is resumed at *four*. As the body is straightened from the *wing* position, a full breath should be taken, the lungs being filled to the maximum as *cross* is resumed at the completion of the movement. This breath should be retained during the *curl* movement, and exhaled as the *wing* position is taken. Inhale through the nose.)

ORDER: *rest*.

The entire movement should be repeated five times.

3. CROUCH

CROUCH: READY: *cross*. (In this movement, at *cross*, the feet are spread until

the heels are about twelve inches apart. The left foot remains stationary, the right foot being moved to accomplish this.)

ORDER: *crouch.* (At *crouch*, the knees are bent and, with the weight on the toes, the body is lowered nearly to the heels, keeping the trunk as nearly erect as possible. See Figure 12. This is done at *one* and at *two* the upright position is resumed.)

ORDER: *rest.*

The entire movement should be repeated ten times.

GROUP IV

1. WAVE

WAVE: **READY:** *cross.*

ORDER: *wave.* (At *wave*, the arms are stretched straight above the head, fingers interlaced and arms touching the ears. See Figure 13. Then, as the Leader counts *one*, *two*, *three*, *four*, a complete circle, of

about twenty-four inches diameter, is described with the hands, the body bending only at the waist. The trunk should be bent as far backward as forward, and as far to one side as to the other. The body should be forward at *one*, to the right at *two*, backward at *three*, and to the left at *four*. The motion should be steady and not in jerks.)

Reverse. (At *reverse*, the same movement should be repeated in the opposite direction, *i. e.*, to the left.)
one
etc.

ORDER: *rest.* (At ORDER, the body should be brought to an erect position, stretching the arms up as far as possible; and at *rest*, the arms should drop slowly, laterally, to a *hands* position.)

Five circles should be described in each direction.

2. WEAWE

WEAVE: READY: *cross.* (In this movement, at *cross*, the feet are spread until

the heels are about twelve inches apart. The left foot remains stationary, the right foot being moved to accomplish this.)

ORDER: *weave*

one

two

three

four

—

one

two

three

four

—

(At *weave*, and as the Leader counts *one, two, three, four*, the body is turned to the left from the hips, the arms maintaining the same relation to the shoulders as at *cross*, until at *one*, the face is to the left, the right arm pointing straight forward (in relation to the feet) and the left arm straight backward. See Figure 14. At *two*, the body is bent from the waist so that the right arm goes down and the left up, until, at *three*, the fingers of the right hand touch the ground midway between the feet. The left arm should then be pointing straight up, with the face still to the left. The right knee must be slightly bent to accomplish

this position. See Figure 15. At *four*, the position of *cross* is resumed and as the Leader again counts *one, two, three, four*, the same movement is repeated with the left hand touching the ground this time. Throughout the exercise, care should be taken that the arms remain in the same straight line, making no separate movement, but changing their position only as the trunk and shoulders are moved and carry the arms along. After this exercise has been thoroughly mastered, the turning and bending movements made on the counts, *one* and *two*, should be combined, *i. e.*, instead of making the entire turn, as described above, before bending, turn and bend simultaneously. See Figure 16.)

ORDER: *rest.*

The entire movement should be repeated ten times.

3. WING

WING: READY: *cross.*ORDER: *wing.**one**two**three**four*

—

*one**two**three**four*

—

(At *wing*, and as the Leader counts *one, two, three, four*, the arms are raised laterally until they are extended straight upward at *one*. See Figure 17. At *two*, the arms begin to fall forward and downward and the body bends forward from the waist, head up and eyes front, until at *four*, the body has reached the limit of motion and the arms have passed the sides and have been forced back and (as the trunk assumes a horizontal position) up as far as possible. See Figure 18. As the Leader again counts *one, two, three, four*, the body is straightened, reaching an upright position, with arms vertically extended, at *three*. At *four*, the arms are lowered to a *cross* position but with palms up and

arms and shoulders forced hard back. Very slow counting is essential to the correct execution of this exercise. All air should be forced from the lungs as the body bends forward to the *wing* position, and they should be filled to capacity as the body is straightened and the arms brought down. Inhale through the nose.)

ORDER: *rest*.

The entire movement should be repeated five times.



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